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No. 2

AGRONOMY

C. V. PIPER, *Editor*

162. RICHARDSON, A. E. V. *Agriculture. America and Australia compared.* Jour. Dept. Agric. Victoria 17: 1-20. 1919.—A lecture, comparing agricultural methods in America with those in Australia, before the Royal Agricultural Society at Melbourne, Dec., 1918.—*J. J. Skinner.*

163. HAYES, H. K., AND E. C. STAKMAN. *Rust resistance in timothy.* Jour. Amer. Soc. Agron. 11: 67-70. 1919.—See Bot. Absts. 3, Entry 107.

164. CARRIER, LYMAN. *A reason for the contradictory results in corn experiments.* Jour. Amer. Soc. Agron. 11: 106-113. 1919.

165. ARNY, A. C., AND R. J. GARBER. *Field technic in determining yields of plots of grain by the rod-row method.* Jour. Amer. Soc. Agron. 11: 33-47. 1919.—Data is given (1) on the precision obtained by determining yields by the removal of rod-rows from tenth-acre plots as compared with harvesting and thrashing the entire plots, and (2) the comparative labor requirements of determining yields by the two methods. It was found that nine rod-rows removed from tenth-acre plots gave practically as accurate indications of the value of fertilizer treatments as harvesting the product of the entire plots. Details of the methods used are given together with a discussion of the literature. [See Bot. Absts. 3, Entry 2079.]—*J. J. Skinner.*

166. ARNY, A. C., AND F. H. STEINMETZ. *Field technic in determining yields of experimental plots by the square yard method.* Jour. Amer. Soc. Agron. 11: 81-106. 1919.—It was found that yields determined from 4 to 5 systematically distributed square yard areas removed from plots one-tenth acre in size or less of relatively uniform crop may be confidently substituted for those from the entire plot. A large mass of data is presented showing the probable errors in plot work.—*J. J. Skinner.*

167. WINTERS, R. Y. *Community cotton improvement in North Carolina.* Jour. Amer. Soc. Agron. 11: 121-124. 1919.—In a test of 9 varieties of cotton seed the Cleveland variety produced largest yield.—*J. J. Skinner.*

168. BUTLER, O. *The effect of environment on the loss of weight and germination of seed potatoes during storage.* Jour. Amer. Soc. Agron. 11: 114-118. 1919.—See Bot. Absts. 3, Entry 137.

169. MATSON, J. Lucerne: Why an irrigated crop. *Agric. Jour. India* 14: 85-90. 1919.—The experiments recorded, show that unirrigated lucerne can be established successfully in India on most soils of the Gangetic plain and where there is sufficient moisture in the sub-soil it produces large yields. The yield was not as large as on the best irrigated soil. The unirrigated lucerne withstands the monsoon better than the irrigated.—*J. J. Skinner.*
170. KATTUR, G. L. An improved type of cotton for the southern Maratha country. *Agric. Jour. India* 14: 165-167. *Pl. I.* 1919.—The locally grown cotton for the Southern Maratha Country, *jowari-hatti* is sown in August and matures in March. It is a stunted plant producing about 320 pounds seed cotton per acre. The staple is long though uneven and weak. An erect type has been produced from the local cotton, which fruits earlier and yields 12 per cent more. The improved type is superior to any of the Kumpta cottons, and is described as high, clean, long in staple, uniform, and of middling strength.—*J. J. Skinner.*
171. CUTLER, G. H. A dwarf wheat. *Jour. Amer. Soc. Agron.* 11: 76-78. 1919.—Among the Marquis wheat growing at the University of Alberta appeared a dwarf variety about 9 inches high. The origin of this peculiar form was not determined.—*J. J. Skinner.*
172. OSBORNE, T. B., and L. B. MENDEL. The nutritive value of the wheat kernel and its milling products. *Jour. Biol. Chem.* 37: 557-601. 1919.—The by-products of milling are better utilized on the farm than on the table. The aim of the miller should be to effect such a separation of the other parts of the wheat kernel from the endosperm as will lead to a minimal transfer of the latter into offal. Every grade of flour which is made with a loss of endosperm into milling by-products represents a loss of human nutrients.—*George B. Rigg.*
173. LEIGHTY, C. F., and T. B. HUTCHESON. On the blooming and fertilization of wheat flowers. *Jour. Amer. Soc. Agron.* 11: 143-162. *2 fig.* 1919.—See Bot. Absts. 3, Entry 2161.
174. STEWART, GEOFFGE. The varieties of small grain and the market classes of wheat in Utah. *Jour. Amer. Soc. Agron.* 11: 163-169. 1919.—A survey was made of the wheat, oats and barley grown in Utah in 1918, and the varieties determined. It was found that the varietal names are frequently misapplied and the varieties badly mixed. The Dicklow and New Zealand varieties on irrigated farms and Turkey, Kofod, Bluestem and Gold Coin varieties on the dry farms were found to be the most common wheats grown. The Swedish Select variety of oats was grown universally.—*J. J. Skinner.*
175. KOCH, G. P., and J. R. BUTLER. Cross-inoculation of legumes. *Soil Sci.* 6: 397-403. 1918.—See Bot. Absts. 3, Entry 362.
176. WARBURTON, C. W. The occurrence of dwarfness in oats. *Jour. Amer. Soc. Agron.* 11: 72-76. *Fig. 1-2.* 1919.—The occurrence of dwarfness in Victory oats planted at Aberdeen, Idaho, is reported. Seeds from the original selection proved that the dwarf strain is recessive.—*J. J. Skinner.*
177. SUMMER, JAMES B. The globulins of the jack bean. *Canavalia ensiformis*. Preliminary paper. *Jour. Biol. Chem.* 37: 137-142. 1919.—See Bot. Absts. 3, Entry 133.
178. TOTTINGHAM, W. E. A preliminary study of the influence of chlorides on the growth of certain agricultural plants. *Jour. Amer. Soc. Agron.* 11: 1-32. 1919.—See Bot. Absts. 2, Entry 1310.
179. WOOTON, E. O. Certain desert plants as emergency stock feed. *U. S. Dept. Agric. Bull.* 728. *27 p., 8 pl., 1 fig.* 1919.—In western Texas and the southern parts of Arizona and New Mexico, *Yucca elata* occurs on sandy plains in greater or less abundance. It is usually referred to by the English-speaking population as "soap weed," but is often called *amole* or *palmilla*, the latter its proper Mexican name. It is called "soap weed" and *amole* because its roots and stems are frequently used as a soap substitute.—Newly devised shredding

machines have made it possible to convert into usable form the nutritious stems and leaves of yucca, as well as similar plants, thus developing a highly valuable emergency stock feed.—Mature cattle are fed 20 to 40 pounds of shredded soap weed and 1 to 2 pounds of cottonseed cake per day. With the chopped feed alone, 20 to 25 pounds per day will save stock from starvation. With a pound of cottonseed cake in addition, a fairly well-balanced ration is secured.—The average cost of feeding 20 pounds of chopped soap weed per animal is about 50 cents a month. With the addition of cottonseed cake when worth \$67 per ton at the ranch, animals can be kept in good condition, and sometimes improved, for about 5 cents per day per animal at the present prevailing prices of labor, fuel, oil, etc.—It has been proven that most of the species of yucca are not likely to recover after cutting. The most valuable species, *Yucca elata* (soap weed) and *Yucca glauca* (bear-grass), may be expected to recover, the former slowly and the latter more rapidly, especially if the plants are not cut too close and are given opportunity to grow.—C. V. Piper.

180. FORSLING, C. L. Chopped soapweed as emergency feed for cattle on southwestern ranges. U. S. Dept. Agric. Bull. 745. 20 p., 6 pl. 1919.—On these great arid plains, the greatest handicap to the stock industry has been eliminated by the proper use of soapweed (*Yucca elata*) as a cattle feed during the extended droughts. The dead basal leaves are burned off; the remainder of the 3-foot tall plants is chopped or shredded by recently invented machines. The cattle thrive upon it and relish it, especially when shredded, either fresh, as ensilage, or in combination with cotton-seed meal. Analyses of chopped soapweed compare favorably with those of native forage grasses for feed. Conservation is necessary since soapweed grows very slowly and is the only protection the cattle have from wind storms. A number of smaller related species are likewise used, more profitably, however, as ensilage. [See Bot. Absts. 2, Entry 652].—A. R. Bechtel.

181. FEDERAL HORTICULTURAL BOARD. U. S. DEPT. AGRIC. Amendment No. 2 to regulations supplemental to notice of quarantine No. 37. Service and regulatory announcements 61. 33 p. 1919.—See Bot. Absts. 3, Entry 400.

182. FEDERAL HORTICULTURAL BOARD. U. S. DEPT. AGRIC. Nursery stock, plant and seed quarantine. Notice of quarantine No. 37, with regulations. Service and regulatory announcements 57: 101-110. 1919.—See Bot. Absts. 3, Entry 401.

183. DRAKE, J. A., AND J. C. RUNDLES. Sweet clover on corn belt farms. U. S. Dept. Agric. Farmers' Bull. 1005. 28 p., fig. 1-9. 1919.

184. YODER, P. A. Growing sugar cane for sirup. U. S. Dept. Agric. Farmers' Bull. 1034. 35 p., fig. 1-15. 1919.

185. ANONYMOUS. Geography of U. S. botanical drugs. Pharm. Era 52: 63-66, 89-92. 9 fig., 2 maps. 1919.—See Bot. Absts. 3, Entry 424.

186. SKINNER, J. J., AND F. R. REID. The influence of phosphates on the action of alpha-crotonic acid on plants. Amer. Jour. Bot. 6: 167-180. Fig. 1-9. 1919.—See Bot. Absts. 3, Entry 437.

187. PORTER, W. R., AND O. A. STEVENS. Sow thistle and other weeds of similar habits. North Dakota Agric. Exp. Sta. Ext. Div. Circ. 18. 12 p., fig. 1-9. 1919.—Deals with *Sonchus arvensis*, *Carduus arvensis* [*Cirsium arvense*], *Agropyron repens*, *Linaria Linaria*, *Euphorbia Esula* and *Convolvulus arvensis*.—L. R. Waldron.

188. WALDRON, L. R. Alfalfa for North Dakota. North Dakota Agric. Exp. Sta. Ext. Div. Circ. 19. 8 p. 1919.

189. YAMPOŬSKY, CECIL. Potato seed plot and certification of potato seed stocks. North Dakota Agric. Exp. Sta. Ext. Div. Circ. 21. 4 p., fig. 1-2. 1919.

190. WALDRON, L. R. Sweet clover for North Dakota. North Dakota Agric. Exp. Sta. Ext. Div. Circ. 20. 8 p., fig. 1-4. 1919.

191. WERNER, H. O. Potato culture in North Dakota. North Dakota Agric. Exp. Sta. Ext. Div. Circ. 22. 8 p. 1919.

192. WALDRON, L. R., AND W. R. PORTER. Brome-grass, slender wheat-grass and timothy. North Dakota Agric. Exp. Sta. Ext. Div. Circ. 24. 8 p. 1919.—Deals with *Bromus inermis*, *Agropyron tenerum*, and *Phleum pratense*.—L. R. Waldron.

193. ANONYMOUS. Conversion of grass land into tillage. Jour. Dept. Agric. Ireland 19: 215-218. 1 fig. 1919.—Considers selection, cultivation, and use of tilled crops.—Donald Folsom.

194. ANONYMOUS. Permanent pasture grasses. Jour. Dept. Agric. Ireland 19: 209-214. 1919.—Gives directions for changing cultivated land to hay or pasture land. Considers previous cropping, seed selection, preparation of soil, and later treatment.—Donald Folsom.

195. ANONYMOUS. Field experiments, 1918. Jour. Dept. Agric. Ireland 19: 180-208. 1919.—Summarizes experiments conducted in all parts of Ireland from 1901 to 1918 and concerned with: (1) potatoes (*Solanum tuberosum*) in regard to manure and artificial-fertilizer requirements, the use of peaty soils and seaweed fertilizer, the sprouting and importation of seed tubers, and the comparison of varieties; (2) mangels (*Beta vulgaris*) and turnips (*Brassica campestris*) in regard to manure and artificial-fertilizer requirements, the use of peaty soils, and the comparison of varieties; (3) oats (*Avena sativa*) in regard to artificial-fertilizer requirements, the use of peaty soils, and the comparison of varieties; and (4) wheat (*Triticum sativum*) in regard to the comparison of varieties in 1918 and the control of bunt by means of copper sulphate.—Donald Folsom.

196. BAILEY, HERBERT S. The production and conservation of fats and oils in the United States. U. S. Dept. Agric. Bull. 769. 48 p. 1919.—An account of the sources, methods of extraction, and uses of cottonseed oil, olive oil, peanut oil, coconut oil, palm kernel oil, palm oil, corn oil, soy bean oil, linseed oil, castor oil, lard, tallow, butter and cheese, fish oils, and other vegetable and animal products. Tables are given showing the yearly production, importation, and exportation of various fats, oils, and their derivatives in the United States from 1912 to 1917, and the monthly production from January to June, 1918. Methods of conserving and increasing the supply of these products are discussed. Emphasis is placed upon the increasing use of vegetable oils in place of certain animal fats, and the substitution of less well-known oils for those difficult to obtain. A new hydrogenation process "makes it possible not only to produce hard fats from liquid oils, but also to convert oils formerly considered inedible into sweet, white, perfectly wholesome products."—L. W. Sharp.

197. JORDAN, W. H. Director's report for 1918. New York Agric. Exp. Sta. [Geneva] Bull. 457. 25 p. 1918.—See Bot. Absts. 3, Entry 856.

198. FEDERAL HORTICULTURAL BOARD. U. S. DEPT. AGRIC. Amendment No. 1 to regulations supplemental to notice of quarantine No. 37. Service and regulatory announcements 60: 21-22. 1919.—See Bot. Absts. 2, Entry 1294; 3, Entry 399.

199. SCOFIELD, C. S., T. H. KEARNEY, C. J. BRAND, O. F. COOK, AND W. T. SWINGLE. Production of American Egyptian Cotton. U. S. Dept. Agric. Bull. 742. 30 p. 1919.—Egyptian cotton is described as having a fine, very strong, long staple fiber, used in the manufacturing of sewing thread, hosiery, automobile tire fabrics, and fine and fancy dress goods. Practically all Egyptian cotton used heretofore in the United States has been imported from Egypt, the annual importations during the past ten years having been over 180,000 bales of 500 pounds each. The production of this type of cotton in the United

States has grown from 375 bales in 1912 to 18,000 bales in 1917 under the direction and stimulation of the U. S. Department of Agriculture. Egyptian cotton grown in the United States is as good as the best cotton grown in Egypt. The chief difficulties in the production of this cotton in the United States are (1) lack of reliable seed stock, and dependable varieties, (2) lack of cooperation on part of growers in order that a sufficient quantity may be grown to establish standards and be of commercial importance. Cultural methods, diseases, and requirements of the crop are also considered.—*R. G. Wiggins.*

200. PIÉDALLU, ANDRÉ. Sur l'importance du sorgho sucré. [Importance of sweet sorghums.] *Compt. Rend. Acad. Agric. France* 30: 1091-1095. 1917.—Brief notes on the history and uses of this crop. [See also following Entry, 201.]—*C. V. Piper.*

201. DYBOWSKI, M. J. Sur l'importance du sorgho sucré. [Importance of sweet sorghums.] *Compt. Rend. Acad. Agric. France* 30: 1075-1077. 1917.—Introductory reference to paper by André Piédallu. [See also preceding Entry, 200.]—*C. V. Piper.*

202. VILMORIN, J. DE AND A. MEUNISSIER. Le blé et sa culture en France. [Wheat and its culture in France.] *Rev. Gen. Sci. Pur. et Appl.* 29: 694-706. *Fig. 1.* 1918.—This essay briefly discusses wheat as to its history, species, varieties, and their origin, breeding, temperature relations, diseases and particularly methods to improve the average yield in France both in quantity and quality.—*C. V. Piper.*

203. VILMORIN, JACQUES DE. Essais et observations sur les blés à Verrieres en 1917. [Trials and observations on wheats at Verrieres in 1917.] *Compt. Rend. Acad. Agric. France* 30: 1077-1086. 1917.—Records of 7 varieties of spring wheat in regard to relative earliness and yielding capacity; also the days required for each to mature when planted March 1, March 15, April 1 and April 15. In addition notes are given on the relative winter injury to 73 varieties of winter wheat.—*C. V. Piper.*

BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

204. COULTER, JOHN M. The botanical work of the National Research Council. *School Sci. Math.* 19: 234-236. 1919.—Abstract.

205. DRUSHEL, J. ANDREW. A plan for studying pines. *Nat. Study Rev.* 15: 6-8. 1919.

206. ULLRICH, FRED T. Course in agriculture for a four year high school. *School Sci. Math.* 19: 214-227. 1919.

207. WOODHEAD, T. W. Academic botany and the farm and garden. *New Phytol.* 18: 50. 1919.—This is a contribution to a symposium on "The reconstruction of elementary botanical teaching." [See also three following Entries, 208, 209, 210.]—*I. F. Lewis.*

208. BLACKMAN, V. H. On some aspects of the plea for reconstruction. *New Phytol.* 18: 50-56. 1919.—See also next preceding and two following Entries, 207, 209, 210.

209. OLIVER, F. W. "No department the door of which should not be opened." *New Phytol.* 18: 56-58. 1919.—See also two preceding and next following Entries, 207, 208, 210.

210. BLACKMAN, F. F. What is botany? *New Phytol.* 18: 58-64. 1919.—See also three preceding Entries, 207, 208, 209.

FOREST BOTANY AND FORESTRY

RAPHAEL ZON, *Editor*

211. FISCHER, CECIL E. C. *Forest grazing and the Nellore "Kancha System."* Indian Forester 44: 531-537. Nov., 1918.—Cattle have severely injured the forests in the Nellore district, and regulations provide certain blocks to be grazed under lease, a deferred system being used. The aim is for communal grazing and communal forest protection. The conflict of grazing and forestry is recognized, and areas are divided into forests and fuelwood areas, and grazing lands. On the latter, all the timber of value will be removed and logging will be done to encourage forage and to discourage forest reproduction. By these operations, it is hoped to evolve pure grazing areas studded with shelter trees, and capable of supporting more cattle than at present. [Through Abstr. in: Agric. Jour. India. 1918: 95-101. 1918.]—E. N. Munns.

212. LEE, Y. K. [Chinese.] *The relationship of forestry to farming.* Khu-Shou [Science, a publication of the Science Society of China.] 4: 43-47. 1918.

213. MCCARTHY, EDWARD F., AND RAYMOND J. HOYLE. *Production of pulp on balsam lands.* Paper 23: 14-18. Oct. 23, 1918.—Data on a stand of balsam in the southern Adirondacks, which shows accelerated growth for period of five decades. All growth data are arranged by age classes. Includes stand tables from samples and plot study of same area, also two other stand tables from caliper records on swamp type in Adirondacks. Amount of reproduction per acre under virgin stand is shown in a table.—The study is chiefly interesting as a suggestion of what will occur on swamp lands if fire is kept out. Authors predict "that these lands may be expected to produce a cord of pulp per acre per year without excessive care."—Edward F. McCarthy.

214. PURVIS, J. E. *The conversion of saw-dust into sugar.* Proc. Cambridge [England] Phil. Soc. 19: 259-260. 1919.—Varying quantities of sawdust from ordinary deal, digested with different acids of varying concentrations yield varying quantities of sugar, depending on the nature of the acid, its strength relative to the amount of sawdust used, and the length of digestion.—Michael Levine.

215. SCHWAB, W. G. *The forests of Tazewell County, Virginia.* Office of State Forester, Bull. 18. 14 p., 6 plates, 1 folded map. 1917.—These three counties are all in the extreme southwestern part of the state, among the mountains, and contain a large amount of forest. Taking the three together, the most important trees are several species of *Quercus*, *Liriodendron tulipifera*, and *Castanea dentata*. The illustrations are from photographs showing the various forest types and conditions of exploitation.—Roland M. Harper.

GENETICS

GEORGE H. SHULL, *Editor*

216. ALLARD, H. A. *Gigantism in Nicotiana tabacum and its alternative inheritance.* Amer. Nat. 53: 218-233. May-June, 1919.—Work of previous investigators on gigantism in *Nicotiana* is reviewed and the independent origin of several different strains of mammoth plants recorded. Giant or mammoth plants have appeared suddenly in commercial plantings of the Sumatra, Maryland, Cuban and Connecticut Havana types of *Nicotiana tabacum*. They also occur in varietal crosses of these types and are reported by the author in progeny of a species cross between *Nicotiana tabacum* and *Nicotiana sylvestris*.—These giant plants are found to differ from the varietal type only in height and number of leaves. One of these plants reached a height of nearly 5 meters and developed 123 leaves. The giant habit of growth with its increased vegetative vigor delays blossoming to such an extent that seed can be obtained only by transplanting the plants to the greenhouse.—Author gives analysis of

1812 F₁ plants of many different varietal and species crosses showing that the giant habit behaves as a simple Mendelian character recessive to the normal form. First generation hybrids between giant and normal plants always flower naturally in the field though the number of leaves is greater than on homozygous normal plants. Intermediate forms have been found to arise in some progenies. These intermediates behave as hybrid forms in that their progeny produce a certain percentage of typical mammoth non-blossoming types.—*J. H. Kempton*.

217. ALLARD, H. A. The Mendelian behavior of aurea character in a cross between two varieties of *Nicotiana rustica*. Amer. Nat. 53: 234-238. May-June, 1919.—A light, yellowish green type of *Nicotiana rustica* with white stems and midribs, resembling in these respects the White Burley variety of *Nicotiana tabacum*, has been designated "aurea."—First generation plants of a cross between this aurea type and a green type of same species were all green. In second generation of 25,000 plants, 24.31 per cent were of aurea type. Extracted aurea plants breed true. Some extracted green plants breed true, while others again segregate into green and aurea plants. Back crosses of heterozygous plants with dominant green type give only green plants in first generation while back crosses between heterozygous plants and recessive aurea type produce approximately equal numbers of green and aurea plants.—The aurea plants are so distinct that they can be definitely classified four or five weeks after germination, making it possible to grow large populations. For this reason and in view of the remarkably uniform Mendelian behavior author suggests that this cross is especially favorable for demonstration of simple Mendelian behavior in all its phases.—*J. H. Kempton*.

218. ANDREWS, A. LEROY. Bryological notes. IV. A new hybrid in *Physcomitrium*. Torreya 18: 52-54. 1918.—See Bot. Absts. 2, Entry 195.

219. ANONYMOUS. Disease and natural selection. Jour. Heredity 9: 374. Dec., 1918.—Extracts from report of H. C. and M. A. SOLOMAN, Mental Hygiene, Jan., 1918. Statistics on syphilitic families, indicating high correlation between morality and total net offspring.—*Merle C. Coulter*.

220. ANONYMOUS. Further evidence that "like marries like." Jour. Heredity 9: 378-379. Dec., 1918.—Quoted from DONALD M. MARVIN, in the Publications of the American Statistical Association: "Marriage obeys the sweeping but silent force of propinquity, which is especially potent in determining mate selection." In test samples reported by the United States Census, of a thousand women who married, 541 worked; of these 275 married men of the same occupation. Of a thousand men more than 25 per cent married into their own occupation.—*H. H. Laughlin*.

221. ANONYMOUS. Some present aspects of immigration. Jour. Heredity 10: 68-70. Feb., 1919.

222. ANONYMOUS. Heredity of cancer. Jour. Heredity 10: 89. Feb., 1919.

223. ANONYMOUS. Better dairying by bull associations—joint use of good sires improves herds. Jour. Heredity 10: 135. Mar., 1919.

224. ANONYMOUS. Variation, selection and mutation in one of the protozoa. Jour. Heredity 10: 143. Mar., 1919.

225. ANONYMOUS. Families of the first born. Jour. Heredity 10: 160. Apr., 1919.

226. ANONYMOUS. Develops new hybrid cowpeas. Jour. Heredity 10: 175. Apr., 1919.—See Bot. Absts. 3, Entry 972.

227. ANONYMOUS. Inheritance of continuous and discontinuous variations. Jour. Heredity 10: 191. Apr., 1919.

228. ANONYMOUS. Inheritance of characters in the culinary pea. [Rev. of: WHITE, O. E. Studies of inheritance in Pisum. II. The present state of knowledge of heredity and variation in peas. Proc. Amer. Phil. Soc. 56: 487-588. 1917.] Gard. Chron. 65: 230. May 10, 1919.

229. BATESON, W. Studies in variegation. I. Jour. Genetics 8: 93-99. Pl. 3-4, 1 fig. Apr., 1919.—See Bot. Abstr. 3, Entry 594.

230. BECKING, L. G. M. BAAS. Some numerical proportions in panmictic populations. Rec. Trav. Bot. Néerland. 15: 337-366. 1 pl. 1918.—As Hardy, Pearson, Jennings, and others pointed out, the population $RAA + SAa + Taa$ will remain constant in its proportions after a number of random-matings. Pearson's "Law of ancestral heredity" as applied to Mendelian populations is based upon this fact only. Now, Pearson's Law cannot be generalized. As writer points out a population with random mating (so-called panmictic population) does not remain constant in its proportions if there are two or more than two genotypic differences. Formulae for the different constituent groups are easily derived. Writer has done so for a digene population. The formulae obtained give rise to many particular consequences. In the first place we can prove that the population reaches a limiting value after a great number of generations, the homozygotes being proportional in pairs. This limiting population remains constant in its constitution. The constitution of the original population is of no influence on that limiting form. These qualities are also true for populations with more than two genotypic differences.—In the second place it is easily proved that if the homozygotes are equal in pairs, they will be all equal to each other after a great number of generation: Thirdly: if in a certain population the number of the homozygotes : mono-heterozygotes : di-heterozygotes : n-heterozygotes = $1 : 2 : 2^2 : 2^n$, that population will be constant in its constitution. The formulae are treated also geometrically, this method demonstrating clearly the fact that all populations will reach the same limiting value. It seems of importance to take wild populations (e.g., endemic populations on small islands) as an object of inquiry to test the value of the formulae. If there is panmictic mating in that population, there must exist certain numerical relations between the different genotypic constituents. The random mating, being the most general case of syngamy, thus offers a good starting point for mathematical investigation of Mendelism.—L. Baas Becking.

231. BEST, HARRY. The blind: their condition and the work being done for them in the United States. 20 × 15 cm., xxi + 763 p. Macmillan Co.: New York. 1919.—Comprehensive treatise in which chapter 7 (p. 126-154) deals with "Blindness and heredity." From census of 1910 it is found that 24.1 per cent of all blind have near relatives who are also blind. Similar results are also presented from reports of various schools for the blind. Analysis of causes of hereditary blindness indicates that they are for most part specific affections of the eye. Most notable of these is cataract, of which there are several different hereditary forms. Other diseases having strong hereditary tendencies are glaucoma, retinitis pigmentosa, detachment of the retina, one form of atrophy of optic nerve, etc. A number of diseases which occasionally result in blindness, also show marked influence of heredity. Author considers effect of marriage of blind *inter se*. Quotes census report showing that blindness is handicap to marriage, the proportion of married among the blind 15 years old or over being about 89 per cent of normal. This handicap is especially effective when blindness occurs before age of 20 years. Data on marriage between two blind persons are not available in census reports but direct inquiry indicates presence of several hundred couples in United States of America, who were both blind at time of marriage. On very limited information concerning these families, conclusion is reached that two blind parents do not necessarily have more blind children than a mating between a blind and a normal person. This statistical result is explained on basis of fact that blindness is result of many independent causes, so that in matings between two blind persons there is still no case in which both parents are blind for same cause.—In some families consanguineous marriages considerably increase proportion of blind progeny while in other families no such result is found. Advocates eugenical laws and education directed toward the elimination of diseases which are known to be correlated with hereditary blindness.—G. H. Shull.

232. BLAKESLEE, A. F. A unifoliate mutation in the Adzuki bean. *Jour. Heredity* 10: 153-155. *Fig. 2*. Apr., 1919.—See *Bot. Absta.* 3, Entry 980.

233. BRIERLY, W. B. Experimental studies in the specific value of morphological characters in the fungi. *Proc. Linnean Soc.* 1918: 55-56. 1918.

234. BRODERICK, F. W. Hardy apples and plums for the Canadian Northwest. *Minnesota Hortic.* 46: 393-399. 1 *pl.*, 1 *fig.* Nov. 1918.—Discussion of development of hardy apples and plums for Canadian northwest. Mention is made of the results of prominent horticulturists in work. A list of most promising apple and plum varieties is included. Crosses of hardy standard varieties with *Pyrus baccata* proved to be hardy. In the plum, selections were made from native wild seedlings. In general three methods have been used in obtaining hardy varieties: crossing hardy varieties and selecting the best seedlings; selections of best types from the wild; and importation.—*M. J. Dorsey*.

235. CASTLE, W. E. Piebald rats and the theory of genes. *Proc. Nation. Acad. Sci. U. S. Amer.* 5: 126-130. 1 *fig.* Apr., 1919.—Two conceptions of heredity are contrasted. "Unit-characters" (character differences acting as units in heredity), may show variation, as result of crossing or of selection. This indicates that the hereditary unit varies. On other hand it is supposed that hereditary unit, gene, is invariable, except for rare and sudden changes, mutations, and that variation in character is due to recombinations of other genes, modifiers. Hooding character in rats acts as recessive unit difference from self, but shows great hereditary variation. Plus-selected race with mean grade of + 3.73 and standard deviation of 0.36 was thrice crossed and extracted from wild self. Mean grade was reduced to + 3.04 with standard deviation of 0.64. Minus-selected race with mean grade of - 2.83 and standard deviation of 0.27 was thrice crossed and extracted from wild self. Mean grade was raised to + 2.55 (in one family of 14 hooded to + 3.05) with standard deviation of 0.66. Standard deviation was high at first extraction and somewhat reduced at third. These facts indicate that the variability of the hooded character is due to residual heredity or modifying factors rather than to changes in hooded gene proper.—*P. W. Whiting*.

236. CASTLE, W. E. Siamese, an albinistic color variation in cats. *Amer. Nat.* 53: 265-268. May-June, 1919.—Complete albinism occurs in rats, mice, and rabbits. Partial albinism of "Himalayan" type occurs in guinea-pigs and rabbits, of "red-eyed" and "dilute" types in guinea-pigs, and of "ruby-eyed" type in rats. Genetic locus for albinism is probably homologous in different rodents. "White-spotting" and "pink-eye" are not allelomorphs with albinism. Blondism in man may, according to Wright, be partial albinism. Partial albinism acts as recessive, is more pronounced in young, reduces pigment in eye, and tends to suppress or eliminate yellow pigment in coat. Siamese dilution in cats has these characteristics except that it is not completely recessive. Doctor in England furnishes data in reference to crosses with other strains. First generation animals from black are almost black, but incline toward seal brown as in ears of Siamese. Other crosses produce white or yellow spotting according to expectation. Siamese voice and "cross-eyes" are more or less dominant. An F₁ female crossed to pure Siamese gave three Siamese pure in all respects. Other types were not mentioned. "Blue-pointed" Siamese were obtained, presumably from crosses with maltese. Siamese, as far as reported, is always non-agouti. Agouti forms could probably be obtained by crossing to tabby.—*P. W. Whiting*.

237. COLE, LEON J., AND FRANK J. KELLEY. Studies on inheritance in pigeons. III. Description and linkage relations of two sex-linked characters. *Genetics* 4: 183-203. Mar., 1919.—See *Bot. Absta.* 3, Entry 2102.

238. COLLINS, G. N. A fossil ear of maize. *Jour. Heredity* 10: 170-172. *Fig. 7*. Apr., 1919.—See *Bot. Absta.* 3, Entry 984.

239. COLLINS, G. N. Intolerance of maize to self-fertilization. *Jour. Washington [D. C.] Acad. Sci.* 9: 309-312. June 4, 1919.—See *Bot. Absta.* 3, Entry 607.

240. CONKLIN, EDWIN G. *Heredity and democracy. A reply to Mr. Alleyne Ireland.* Jour. Heredity 10: 161-164. Apr., 1919.—See Bot. Absts. 3, Entry 964.

241. CONNORS, C. H. *Methods in breeding peaches.* Proc. Amer. Soc. Hortic. Sci. 14: (1917) 126-127. 1918.—See Bot. Absts. 2, Entry 724; 3, Entry 608.

242. CRANDALL, C. A. *Apple bud selection: Apple seedlings from selected trees.* Illinois Agric. Exp. Sta. Bull. 211: 181-284. 45 fig. 1918.—Object of this experiment, begun in 1907, was (a) to determine, for purposes of propagation, whether there are differences between large and small buds, between buds produced on different parts of the tree and, (b) to determine what differences there are, if any, between seedlings grown from seed taken from large fruit as compared with those from small fruit borne on same tree. Bud selection experiments were carried on extensively and with great care. Tests were made by means of buds and grafts on seedling stock of mixed apples. In seed bed and nursery there was considerable loss from various causes. The trees were planted 15 × 15 feet in the orchard. Measurement in the different selections was taken first on the terminal growths only and later on both the height and width.—Growth of scions and buds selected as noted above was remarkably similar. In each group there were fluctuations in growth, and there was considerable variation in the comparative growth from year to year. Author concludes from these extensive tests that for purposes of propagation there are no differences between buds of large and small size, between scions of small or large diameter, or between buds from different situations upon the tree. All buds from healthy shoots appeared from these experiments to be of equal value for propagation, even though each tree selected in this way had distinct individuality. As to seedlings from apples of different size, there was in all great reduction in the seed bed and nursery so that at the end of the 6 year period there was one tree for each 17.2 seeds planted. A comparison of the survival value of seedlings from the large and small fruits showed that seedlings from the former were more resistant to adverse conditions and possessed a higher degree of vitality.—M. J. Dorsey.

243. DARBISHIRE, F. V. *Sugar beet seed.* Jour. Soc. Chem. Ind. Rev. 38: 21. 1919.—See Bot. Absts. 3, Entry 2108.

244. DAVENPORT, C. B. *Heredity of stature in man.* Jour. Heredity 9: 295, Nov., 1918.—Stature is end result of a number of independently varying elements. Separate segments of stature are separately inheritable. Study made on 3298 children, 1738 parents and a number of relatives. Offspring of short or very short regress more toward mean than of tall or very tall, indicating that shorts may carry recessive factors for tallness, while tallis are homozygous. Segments of stature such as neck, length of torso, thigh, and foreleg are inherited according to same law. Persons of extreme stature tend to marry similar persons.—P. W. Whiting.

245. DAVENPORT, CHARLES B. [Rev. of: DOWNING, ELLIOT ROWLAND. *The third and fourth generation: an introduction to heredity.* 184 p. University of Chicago Press: Chicago. 1918. (See Bot. Absts. 3, Entry 248.)] Mental Hygiene 3: 153-154. Jan., 1919.

246. DAVENPORT, CHARLES BENEDICT, ASSISTED BY MARY THERESA SCUDDER. *Naval officers; their heredity and development.* Carnegie Inst. Washington, Publ. 259. 236 p. 1919.—Part One is devoted to an exposition of the principles of pedigree analysis, with special reference to heritable traits which contribute to success of naval officers. Method of inheritance of special traits is described, and an enumeration of the special traits involved is given. "Sea-lust, or thalassophilia, is almost wholly a male character, apparently much more so than nomadism; quite as much so as the beard. Even among the Polynesians the women are not given to going to sea." From hereditary point of view, thalassophilia is a recessive trait. Naval fighters are chiefly hyperkinetic. In their youth they are shown to have been nomadic, thalassophilic, and adventurous.—Part Two is given up to an analysis of the biographies of sixty-eight famous naval officers, laying particular stress on their juvenile promise

and personal traits. Sixty-seven personal traits are noted, ranging from chivalry and courage, to scholarship and self-control. These are traced as they are variously segregated and recombined in the ancestry and finally appear in the propositus.—H. H. Laughlin.

247. DAVIS, ROBERT L. Plant breeder's envelope. Jour. Heredity 10: 168-169. Fig. 6. Apr., 1919.—Seq. Bot. Absts. 3, Entry 992.

248. DOWNING, ELLIOT ROWLAND. The third and fourth generation; an introduction to heredity. 164 p. University of Chicago Press: Chicago. 1918.—One of a series of "Constructive studies" in religious education, published under auspices of Divinity School of University of Chicago. A brief popular treatment of eugenics "for young people." Containing a few plates and figures and numerous pedigree charts. Adapted to class use by questions at end of each chapter. Chapter 1, introduction. 2, Some famous pedigrees. 3, Sexual reproduction (mandrake and frog). 4, Mendel's results and explanation of same, presence and absence hypothesis, partial dominance. 5, Examples of man's achievements: origin of domestic varieties, emphasizing mutation; Jones' "yellows"-resistant cabbage; work of de Vries, Burbank, Johannsen, Nilsson; Aaronsohn's drought-resistant wheat; selection and hybridization in wheat and corn; egg-laying in chickens. 6, Physical basis of heredity, sex chromosomes. 7, Some apparent exceptions to Mendel's law; Bateson's purple sweet peas, and other examples of reversion; factor hypothesis, and coat color in rabbits; phenotype-genotype conception, and multi-hybrid ratios; Nilsson-Ehle's 15 : 1 and 63 : 1; negro-white crosses; sex-linked characters in *Drosophila* and man. 8, Inheritance of acquired characters: fallacy of certain supposed examples; Weismannism; transplantation of ovaries; importance of distinguishing effects of environment and heredity in man; Tower's potato beetles; Stockard's alcoholized guinea-pigs; transmission of venereal diseases. 9, Inheritance of human characters, mostly pedigrees of feeble-mindedness and of royal families. 10, "The practical problem of human heredity." ". . . young people . . . have a right to a frank, yet reverent, presentation of reproduction and heredity;" summarizes earlier chapters of book as far as they bear on eugenics; points out the danger of "survival of unfit" in America, and recommends certain general social, economic, and legal readjustments to meet this danger. [See Bot. Absts. 3, Entry 245.]—Merle C. Coulter.

249. DUERDEN, J. E. Breeding experiments with North African and South African ostriches. IV. Increasing the number of plumes: Degeneration and restoration. Union of South Africa Dept. Agric. Bull. 7. 59 p., 12 fig. 1918.—See Bot. Absts. 3, Entry 2116.

250. EMOTO, Y. On the relative efficiencies of cross and self fertilization in some plants. [Title in English, text in Japanese.] Bot. Mag. Tôkyô 32: 153-186. 2 fig. June, 1918.—See Bot. Absts. 2, Entry 11.

251. FRETZ, G. P. (1) On Mendelian segregation with the heredity of headform in man. Proc. Kon. Akad. Wet. Amsterdam. 20 (1917): 435-448. 7 fig. (2) Complicated Mendelian segregation in the heredity of headform in man. *Ibid.* 20: (1917): 865-874. 1918.—The significance of the shape of the head as an anthropological characteristic was brought to light by the investigations of A. Retzius. He discriminates the brachycephalic or short and round, and the dolichocephalic or long and oval skull type. The inheritance of head form has not yet been investigated methodically. E. Fischer concludes, from his hybrid material that headform is most probably hereditary according to the rules of Mendel.—These first preliminary communications relate to the results of a thousand measurements. As completely as possible all members of the families were measured. Extensive tables will be published later. The material consists of families of from one to three generations (i.e., four grandparents, parents, and children). It is a question whether the Mendelian analysis of factors of heredity of shape of head can restrict itself to tracing heredity of the index. In this case, we should have to do with one pair of units, or with several (Nilsson-Ehle). If length and width Mendelize separately, we have to do either with two pairs of units or with two progressions. Both possibilities are examined. In favor of segregation plead those cases where,

with little differences in the indices of the parents, the children show great divergence of values, or if a single child has a strongly deviating index. Data show great variability and also irregularity of indices.—Proof is presented that headform is not inheritable through a single pair of allelomorphic factors. Data of different families plead for occurrence of plural factors working in the same direction in the sense of Nilsson-Ehle. So *e.g.*, those, where the indices of the children surpass those of the parents in both directions or in one direction.—Dominance may occur as shown by families of which one of the parents and almost all or most of the children are brachycephalic. There are however also families for which this is not the case. Consequently beside segregation simple dominance of brachycephaly cannot be admitted. Nilsson-Ehle's scheme of heredity gives the best explanation for the facts.—It is possible that shape of head is complex character and length and width Mendelize separately. There is however correlation of properties and a Mendelian explanation of it is given by hypothesis of coupling and repulsion of factors. With absolute coupling the two properties can be represented by one factor of heredity. It is quite possible that for the heredity of shape of head, coupling occurs between factors for length and those for width. This means consequently that in general shape of head can be conceived as one single series of Mendelian characters, but that in some cases deviations will be found, which are the consequence of the meeting of gametes of very rare independent factors for length and width. Further investigation of material shows that brachycephalic head-form has not always same behavior in heredity. The brachycephaly may be effect of shortening or of widening of the head. It appears that the brachycephalic, large and wide head is often dominant, while the brachycephalic, small and short head is often recessive to dolichocephalic head-form. It is possible, that for formation of short, small head, the meeting of two factors is necessary. The material given here cannot yet prove this conception.—Broad lines of Mendelism are to be recognized; there are distinct indications of segregation and of independency of factors. With regard to nature and number of the factors of heredity, the phenomena of segregation are too much complicated, to be explained by one pair of factors. Therefore the data are tested by the scheme of heredity of Nilsson-Ehle.—F. P. Fretz.

252. FREUD, SIGMUND. Three contributions to the theory of sex. 3d. revised ed., 117 p. Nerv. and Ment. Dis. Pub. Co.: Washington [D. C.]. 1918.—See Bot. Abstrs. 3, Entry 906.

253. HARLAND, S. C. Tomato breeding in St. Vincent. Agric. News, Barbados 17: 4-5. 1918.—See Bot. Abstrs. 2, Entry 519.

254. HARLAND, S. C. Inheritance of certain characters in the Cowpea (*Vigna sinensis*). Jour. Genetics 8: 101-132. 1 fig. Apr., 1919.—See Bot. Abstrs. 3, Entry 1003.

255. HARPER, R. A. The evolution of cell types and contact and pressure responses in *Pediastrum*. Mem. Torrey Bot. Club 17: 210-240. 27 fig. 1918.—See Bot. Abstrs. 2, Entry 61.

256. HASTINGS, G. T. Some abnormal poplar flowers. Torreya 18: 16-18. 4 fig. 1918.—See Bot. Abstrs. 2, Entry 291.

257. HEUGNER, R. W. Heredity, variation, and the appearance of diversities during the vegetative reproduction of *Arcella dentata*. Genetics 4: 95-150. 27 fig. Mar., 1919.

258. HENDRICKSON, A. H. Five years results in plum pollination. Proc. Amer. Soc. Hort. Sci. 15 (1918): 65-66. 1919.—See Bot. Abstrs. 2, Entry 727; 3, Entry 635.

259. HOLZHAUSEN, A. *Laeliocattleya suecica* nov. hybr. (LC. *Myrra* × *Pallas*). Svensk Bot. Tidskr. Stockholm 13 (part 1): 97-99. 1919.—Author has secured hybrid plants from *Cattleya remula* × *C. labiata*, *C. labiata* × *C. Mrs. Pitt*, *C. Trianaci* × *C. nobilis* and *Laeliocattleya Myrra* × *LC. Pallas*.—The last combination has now flowered and is named *Laeliocattleya suecica*. The parents are also hybrids. *Laeliocattleya Pallas* is *Laelia crispa* × *Cattleya Dowiana* and *Laeliocattleya Myrra* is *Laelia flava* × *Cattleya Triandri*. A photograph of a flower from the plant in question is reproduced.—K. V. Ossian Dahlgren.

260. HUNTER, CAPT. H. The improvement of the barley crop. Jour. Dept. Agric. Ireland 19: 139-150. Fig. 1-11. 1919.—See Bot. Absta. 3, Entry 636.

261. IRELAND, ALLETYN. Democracy and the accepted facts of heredity. Jour. Heredity 9: 339-342. Dec., 1918.—A plea for hereditary autocracy in government, based upon principle of inheritance of leadership and genius. Close analogy is maintained between struggles for leadership and success of the race in species of plants and animals on the one hand and man on the other.—H. H. Laughlin.

262. KEY, WILHELMINE E. Better American families. Jour. Heredity 10: 11-13. Jan., 1919.—A short essay on the nature of social progress and its relation to good blood. The most virile stock of Devon and Somerset is traced through Massachusetts Bay and thence to the old Northwest, evidence of social heritage being measured by the response of men of higher order to the wars of their times. Similarly the persistence of degeneracy is named in the Jukes, Ighmselfites and Kallikaks.—H. H. Laughlin.

263. KIESSLING, L. Einige besondere Fälle von chlorophylldefekten Gersten. [Several special cases of barley defective in chlorophyll.] Zeitschr. induct. Abstamm. Vererb. 19: 100-176. June, 1918.—Briefly reviews earlier studies on genetics of plant characters involving such chlorophyll defects as albino and yellow foliage. In numerous cases cited from literature, heterozygote of green foliage \times either albino or yellow foliage is green-leaved, demonstrating absolute dominance of former. Finds in genetic studies on *Hordeum distichum* L. nutans Schübl. three types of foliage variations involving chlorophyll defects, similar to those cited from literature, which from their behavior in experimental cultures, are similar to DeVries's "Zwischenrassen" (half races, ever-sporting varieties). The first discussed type arose in a hybrid green-leaved strain in which the ancestral plants had had their unopened flower buds injected with a solution of potassium nitrate. Other plants similarly treated gave no such variations. The variation consisted of plants with entirely white (albino) or white-striped foliage. A detailed discussion of its inheritance is given. Two entirely green-leaved plants gave rise the following season to three classes of offspring—green-leaved, striped-leaved, and white- or albino-leaved—in proportions approximating a Mendelian ratio of 12 : 3 : 1 (provided all seed planted grew and those unrepresented when the first observations were made are regarded as albinos). Most of the pure albinos died very soon after germination. One striped-leaved plant of the same origin as the two green-leaved plants mentioned above produced the following season only striped-leaved and albino progeny in proportions approximating a Mendelian ratio of 3 : 1. These ratios suggested a Mendelian two-factor interpretation of the data—one factor for green foliage, and one for striped leaves, the former being dominant. In the absence of the first, the progeny are striped. In the absence of both, albinos result. However, a series of observations made at intervals over a 38-day period on these plants necessitated changes in classification, since all the albinos actually observed either died or later became striped with green. Those classified as green remained unchanged. The expression of striped in the same plant also varied much from time to time. Several hundred seed from the green and white-green striped classes were sown, resulting in still more complex results. Seed from striped plants gave both striped and albino plants, while that from green plants gave green: striped or green: striped and albino in various proportions. No green bred true. Literature on striped and albino foliage variations is discussed in detail.—The second type of variation consisted of shoots with albino and striped leaves arising as a bud sport from a normal green-leaved plant which insects had injured. Efforts to obtain such results again from this and other cultures by various types of mechanical injury were unsuccessful.—The third type of chlorophyll defect studied consisted of a light yellow (not golden yellow)-leaved mutation which for the most part bred true in large cultures. It had fewer chloroplasts per cell and larger leaves than the normal green-leaved form. The few variant plants in these mutant cultures had various kinds of chlorophyll defects such as striped light and dark yellow leaves, white and yellow striped leaves, etc.—Orland E. White.

264. KIRKHAM, WILLIAM B. The fate of homozygous yellow mice. Jour. Exp. Zool. 28: 125-135. 2 fig. May 20, 1919.—In prenatal life of animals two crises occur, one at implantation and one at parturition. Latter is apparently not significant in fate of homozygous yellow mice as the dead young would have been observed if they occurred in anything like the expected number. Mouse ovum has food enough to maintain itself up to blastula stage. Factors are here relatively stable. Much less stable set of factors governs implantation for cleaving ova and blastulas of white mice average over seven per pregnant animal while number of young in litters average less than five. After implantation development is almost always normal up to birth, in mice of all colors. As regards implantation, two sets of factors exist, maternal and embryonic. Corpora lutea stimulate proliferation of uterine mucosa, a necessary antecedent to implantation of blastulas. Mouse blastula stimulates further swelling of uterine connective tissue and dissolution of this along with the epithelium, thus supplying food to embryo. Lactation inhibits both sets of stimuli. Various factors may explain failure of some blastulas to implant in white mice. Time of ovulation from last parturition, time of fertilization, rate of cleavage, and time of implantation is same for all embryos, whites, homozygous yellows and heterozygous yellows, showing that eggs with yellow factor undergo maturation and fertilization even when entered by yellow-bearing sperm. Abnormalities of homozygous yellow appear first in morula. At implantation they plasmolyze and are phagocytized, but nevertheless effect uterine changes, thus differing from abnormal embryos of non-yellow mice. There is in addition to parental abnormality (tendency in yellow of both sexes to fatness and sterility at early age) an inherent weakness in homozygous yellow embryos. It may be possible to transplant ovaries of yellow to non-yellow and thus to obtain homozygous yellow offspring by avoiding abnormal maternal factors. Proportion of degenerate embryos from yellow by yellow is 29+ per cent, very close to Mendelian expectation.—P. W. Whiting.

265. KÜSTER, ERNST. Ueber Mosaikpanaschierung und vergleichbare Erscheinungen. [On mosaic variation and comparable phenomena.] Ber. Deutsch. Bot. Ges. 36: 54-61. 1918.—Mosaic pattern is of very common occurrence among plants. When spots are large they are called marbled, but dotted or pulverulent if spots are very small. Not only absence of chlorophyll but also absence of anthocyan may give rise to mosaic pattern (e.g., *Coleus hybridus* hort.). Shape of the spots, their sharp limitation and often also arrangement of their cells suggest that they took their origin from one initial cell, which in turn arose by an unequal division. There are two different ways in which such an unequal division can be imagined to take place. In agreement with ideas of Weismann one daughter cell might be deprived of a certain part of the protoplasm or nuclear substance, in which case the cell will never be able to show again the lost qualities. Or the daughter cells might differ only in a physiological sense, not in a morphological one, reacting in a different manner to external influences, in which latter case reversion may be involved. Writer believes that divisions of first type have been recorded among Protista, whilst divisions of the second type occur, e.g., when mutants are produced in cultures of bacteria, which afterward show regressions to the mother type. As to the phenomena of mosaic variegation he assumes that the unequal divisions are of the second type and thinks possible that within white spots, green tissue might reappear.—K. Boedyn.

266. LEHMANN, ERNST. Ueber reziproke Bastarde zwischen *Epilobium roseum* und *parviflorum*. [On reciprocal crosses between *Epilobium roseum* and *E. parviflorum*.] Zeitschr. Bot. 10: 497-511. 7 fig. 1918.—Author crossed *E. parviflorum* with *E. roseum* in both directions and obtained two wholly different hybrids, the first of which he called "*E. rigidum*," the second "*E. curvatum*." *E. curvatum* is an intermediate type, with some resemblance to *E. parviflorum*, whilst *E. rigidum*, a more sterile type than *E. curvatum*, looks rather like *E. roseum*. According to the fact that in *Epilobium* unlike reciprocal hybrids were discovered this genus becomes of great interest especially in connection with recent researches on *Oenothera*.—K. Boedyn.

267. LORSY, J. P. Over de mogelijkheid van intranucleaire kruising bij homozygoten. [On the possibility of intranuclear crossing in homozygotes.] *Genetica* 1: 92-97. 10 fig. Jan., 1919.—Author shows that when in reduction-division, the chromosomes, combined into a thread, are parting again, there is a certain hypothetical possibility of "chromosome-crossing." Normally the thread breaks up into same pieces (chromosomes) which were united in the dividing nucleus, but it might happen that one chromosome carry with it a chromomere of the chromosome with which it was united. Thus normal chromosomes A, B, C would become by this process A+, B-, C. The gamete which contains this new set of chromosomes will very probably unite with a normal one giving a hybrid with exactly the same number of identical chromomeres as the homozygous plants, only combined in this way: AA+ BB- CC. This hybrid plant would appear exactly like the homozygous plants but would produce four classes of gametes: ABC, AB-C, A+BC, and A+B-C. When selfed F₂ plants will be as follows: 6 plants with same number of chromomeres; 4 plants with one chromomere less than normal; 4 plants with one chromomere more than normal; 1 plant with two chromomeres less than normal (recessive mutant); 1 plant with two chromomeres more than normal (progressive mutant). Both recessive and progressive mutant when crossed with normal will segregate in F₂ in 3 : 1 ratio. Author thinks this is in fair accord with cases in which mutants arise in pure strains. There is no formation of genes in the progressive mutant and thus no mutation as the process is understood by De Vries. Author remarks that crossing of individuals is also necessary for production of new types. Organisms having only non-sexual propagation have no mutative power in this way.—H. N. Kooiman.

268. LORSY, J. P. Bestendige Bastardes. [Constant hybrids.] Vereeniging tot bevordering van wet. teelt 1918 (No. 10): 1-42. 1919.—Chiefly a more popular presentation of matter in author's article on *Oenothera* als kernchimeren [The *Oenothera* as nuclear chimeras] [See Bot. Absts. 3, Entry 52], but differs in that author accepted the existence of chromomeres within the chromosome in the mentioned paper while in present paper the chromosome is treated as an indivisible unit.—At the end he discusses origin of sex and of bisexual animals in normally unisexual species in connection with knowledge of the so-called X and Y chromosomes.—H. N. Kooiman.

269. MACCAUGHEY, VAUGHAN. Race mixture in Hawaii. *Jour. Heredity* 10: 41-47. Jan., 1919.—Asiatics comprise nearly three-fifths of the population of Hawaii, Polynesians less than one-fifth, pure Hawaiians only about one-tenth, mixed Caucasian-Hawaiians and Chinese-Hawaiians about another tenth. In Hawaii Japanese marry only Japanese, but only a little more than half of the Chinese men marry Chinese wives. In general race mixture is proceeding at a rapid rate. The article is accompanied by five tables giving statistics in reference to race and marriage. The analysis includes not only pure races, but the marriages of persons of mixed blood.—H. H. Laughlin.

270. MAXON, WILLIAM R. A new hybrid *Asplenium*. *Amer. Fern Jour.* 8: 1-3. 1918.—See Bot. Absts. 2, Entry 344.

271. MEADER, PERCY D. Variation in the diphtheria group. *Jour. Infect. Diseases* 24: 145-157. 1919.

272. MENDIOLA, NEMESIO BLANCO. Variation and selection within clonal lines of *Lemna minor*. *Genetics* 4: 151-182. 6 fig. Mar., 1919.—See Bot. Absts. 3, Entry 1015.

273. MEYER, ADOLF. The right to marry; what can a democratic civilization do about heredity and child welfare? *Mental Hygiene* 3: 48-58. Jan., 1919.—See Bot. Absts. 3, Entry 2172.

274. MURBECK, SV. En säregen blomnomali hos *Capsella bursa-pastoris*. [Abnormal flowers in *Capsella bursa-pastoris*.] [Swedish, with German summary.] *Ark. Bot.* 15 (No. 12): 1-8. 1 fig. July 25, 1918.—A very large individual of *Capsella bursa-pastoris* was found

in 1897 near the town of Norrköping (Sweden) and is now in the botanical museum of Lund. Petals are absent and stamens seem to be numerous. By close study it is seen that small accessory flowers often consisting of only stamens have taken the place of all the four petals. Especially in the lower parts of the inflorescences, are often found more or less petaloid parts as traces of nectaries. Sometimes also a flower-stalk is developed. Sepals and gynoecium have not been found in these accessory flowers. Author supposes that these flowers have "grown out from new points of vegetation in the axils of the petals and in close connection with the same. Most organs of the accessory flowers are developed from these new growing-points, but at least one of the outside ones is supposed to be grown out from the petal initial.—K. V. Oerian Dahlgren.

* 275. MURRAY, J. G. Relation of the supplying ovary to the causation of sex. Johns Hopkins Hosp. Bull. 29: 275-278. 1918.—See Bot. Absts. 3, Entry 654.

276. NORTON, J. B. S., AND C. E. LEATHERS. Conditions detrimental to seed production. Maryland Agric. Exp. Sta. Bull. 216: 175-226. 1918.—See Bot. Absts. 1, Entries 628 and 747; 2, Entry 730; 3, Entry 656.

277. OLSON, P. J., C. P. BULL, AND H. K. HAYES. Ear-type selection and yield in corn. Minnesota Agric. Exp. Sta. Bull. 174. 60 p., 9 fig. 1918.—This is an investigation of the relation of various characteristics of the seed ear to its yielding qualities. The study includes such score-card points as length, weight, circumference, shelling percentage, perfection of butts and tips, kernel uniformity, variety, character, and maturity. Two methods of experiment were employed: 1, analyzing the data obtained from ear-to-row breeding plots; 2, selecting diverse types of ears and comparing their yields. Work by former method includes three different varieties of corn grown at four different locations and tests by latter method ran through three successive seasons. A critical study of all the results fails to show any significant relation between these ear characters and yield.—L. H. Smith.

278. PLOUGH, HAROLD H. Linear arrangement of genes and double crossing over. Proc. Nation. Acad. Sci. [U. S. A.] 5: 167-168. May, 1919.—See Bot. Absts. 3, Entry 659.

279. POPENOE, PAUL, AND ROSWELL H. JOHNSON. Applied eugenics. 14 × 20 cm., v + 459 p., 48 fig. Macmillan Co.: New York, Oct., 1918.—General text-book on the subject of eugenics, presenting a discussion of the principles and investigations in this field. Considerably more attention is paid to the social forces controlling racial fortunes than to the method of inheritance of specific traits. The relation between eugenics and specific social reforms is discussed in considerable detail. Especially valuable are the chapters on the "Improvement of sexual selection" and "Increasing the marriage rate of the superior."—H. H. Laughlin.

280. PORTER, WILLIAM C. Huntington's chorea; a report of a family history study made in Dutchess and Putnam counties, New York. New York State Hosp. Quart. 4: 64-74. Nov., 1918.—See Bot. Absts. 3, Entry 2179.

281. PREISER, SAMUEL A., AND CHARLES B. DAVENPORT. Multiple neurofibromatosis (von Recklinghausen's disease) and its inheritance: with description of a case. Eugenics Rec. Office Bull. 19. 34 p., 36 fig. Oct., 1918.—The classical symptoms of this disease are "sessile or pedunculated swellings or tumors, sometimes soft and elastic, sometimes firm and tough, that vary in size from that of a millet-seed to that of a child's head." They appear to receive new stimuli at puberty and pregnancies. Associated with it are sometimes found scoliosis, sexual impotency, or feeble-mindedness.—The disease is found only in about 1 in 2000 cases that present themselves to medical clinics or private practitioners for skin diseases. It is highly hereditary, and behaves like a dominant trait. The specificity of location, type and behavior in given families is very striking.—Twenty-nine pedigree charts are printed with the text. There is a bibliography of 119 titles.—H. H. Laughlin.

282. ROBERTS, H. F. Quantitative character-measurements in color crosses. *Science* 49: 516-517. May 30, 1919.—Writer suggests that in the study of coat pattern in animals, photographs be taken of the right and left sides and the areas determined by planimeter, ruled squares on the photographic plate, or by placing the animal behind cross-wire screen before taking photograph.—*Sevall Wright*.

283. ROBERTS, HERBERT F. The founders of the art of breeding. II. *Jour. Heredity* 10: 147-152. 1 fig. Apr., 1919.

284. ROSENBERG, OTTO. Chromosomenzahlen und Chromosomendimensionen in der Gattung *Crepis*. [Chromosome number and chromosome dimensions in the genus *Crepis*]. *Ark. Bot.* 15¹¹: 1-16. 6 fig. 1918.—The haploid number of chromosomes in species of *Crepis* is reported as follows: In *virens*, *polymorpha* var. *stricta*, *Reuteriana*, and *dicholoma*, 3; in *foetida*, *pulchra*, *agrestis*, *parviflora*, *neglecta*, and *nicaensis*, 4; in *multicaudis*, *rigida*, and *rubra*, 5; in *barbata*, 9; and in *biennis*, 20. Previous studies have shown that *lectorum* and *taraxacifolia* have the number 4; *lanceolata* var. *platyphyllos*, 5; and *japonica*, 8.—Special studies of size of chromosomes are reported which show that in species with 3 chromosomes (*virens* and *Reuteriana*) there is 1 large, 1 middle-sized and 1 small chromosome. A species with 4 chromosomes (*C. lectorum*) has 1 large, 1 middle-sized and 2 shorter chromosomes. *C. rubra* has 1 large, 1 middle-sized and 3 short chromosomes. Measurements show that the relative proportions of the different chromosomes are very similar in various species as for example:

	a	b	c	d
<i>C. lectorum</i>	10	: 7.9	: 5.9	: 5.3
<i>C. Reuteriana</i>	10	: 7.4	: 5.7	

Heterotypic divisions show evidences of irregular distribution of chromosomes. The short chromosomes especially tend to go to the wrong pole or to lag and be left behind. In *Reuteriana* about 30 per cent of the divisions show such a tendency, which it is considered may give microspores and macrospores of 3 and 2 chromosomes. In a species with 4 chromosomes, as *C. lectorum*, when a short chromosome goes to the wrong pole spores with 5 (1 large, 1 middle-sized, 3 small) chromosomes and spores with 3 (1 large, 1 middle-sized, 1 short) chromosomes would be formed.

Conclusion is that the 3, 4 and 5 series of chromosome numbers in species of *Crepis* arises through irregular distribution of the smaller chromosomes in reduction divisions and subsequent recombination in fertilization rather than through segmentation or fragmentation of the larger chromosomes.—*A. B. Stout*.

285. SAKAMURA, TETSU. Kurze Mitteilung über die Chromosomenzahlen und die Verwandtschaftsverhältnisse der Triticum-Arten. [Chromosome number, etc., in Triticum.] *Bot. Mag. Tôkyô* 32: 151-154. 1918.—From studies on root tips and on pollen mother cells author obtained diploid chromosome counts on races of wheat as follows.—*Triticum vulgare* 42, *T. compactum* 42, *T. spelta* 42, *T. turgidum* 28, *T. durum* 28, *T. polonicum* 28, *T. dicoccum* 28, *T. monococcum* 14. This contrasts with haploid counts by Overton, Nakao, Bally and Dudley of 8 chromosomes for *T. vulgare* and of Kornicke's haploid count of 8 chromosomes for *T. compactum*. Author concludes that the primitive chromosome numbers in Triticum species were haploid 7, diploid 14, and that the diploid chromosome number holds the following relation to Schulz's grouping.—Einkornreihe, diploid, 14 chromosomes (*T. monococcum*); Emmerreihe, tetraploid, 28 chromosomes (*T. dicoccum*, *durum*, *polonicum*, *turgidum*); Dinkelreihe, hexaploid, 42 chromosomes (*T. compactum*, *spelt*, *vulgare*). The chromosome count of rye, *Secale cereale*, is reported as haploid 7, diploid 14.—*B. M. Davis*.

286. SALMON, C. E. Papaver Rhæas, P. dubium and the hybrid between them. *New Phytol.* 18: 111-117. 7 fig. Mar.-Apr., 1919.—See Bot. Absts. 3, Entry 2187.

287. SALMON, C. E. A hybrid Stachys. *Jour. Linnean Soc., London* 44: 357-362. 1 fig. May 16, 1919.—See Bot. Absts. 3, Entry 2188.

288. SALMON, E. S. On forms of the hop (*Humulus Lupulus* L.) resistant to mildew (*Sphaerotheca Humuli* (DC) Burr.). II. Jour. Genetics 8: 83-91. Apr., 1919.—See Bot. Abstr. 3, Entry 2189.

289. SAND, K. Experimenteller Hermaphroditismus. [Experimental hermaphroditism.] Pflüger's Arch. Physiol. 173: 1-7. 1918.—See Bot. Abstr. 3, Entry 1031.

290. SHEPPARD, W. J. Hermaphrodite bees. Jour. Heredity 10: 160. Apr., 1919.—See Bot. Abstr. 3, Entry 1035.

291. SOUTHWORTH, W. Twinning in alfalfa. Jour. Heredity 10: 182-183. Fig. 12-13. Apr., 1919.—See Bot. Abstr. 3, Entry 1037.

292. STOUT, A. B. Bud variation. Proc. Nation. Acad. Sci. [U. S. A.] 5: 130-134. Apr., 1919.—Further results fully in agreement with facts and conclusions given by author in Carnegie Inst. Washington Publ. No. 218, 1915. Discusses early views on bud variation, and mentions the following tendencies in present day interpretations: (1) transmission by cytoplasm rather than nucleus; (2) factor losses by segregative somatic divisions; (3) spontaneous factor changes in soma. Author has studied bud variations in *Coleus* through 14 generations. Sixteen new color patterns obtained; 15 were constant from first, but 6 of them also appeared as fluctuating variations; one appeared only as a fluctuating variation. Selection for extremes always brought progeny of marked constancy, but with further fluctuations about a new mode. Concludes that recombinations of multiple modifying factors are impossible in bud propagation, and effectiveness of selection indicates actual variation in hereditary units. Reversion to parent patterns cited. Decrease of red and yellow pigment is twice as frequent as increase. Most frequent bud variation was 1:2960.—Merle C. Coulter.

293. STURTEVANT, A. H., C. B. BRIDGES, AND T. H. MORGAN. The spatial relations of genes. Proc. Nation. Acad. Sci. [U. S. A.] 5: 168-173. May, 1919.

294. TERRY, J. R. A wingless Wyandotte. Jour. Heredity 10: 175. Fig. 8. Apr., 1919.—See Bot. Abstr. 3, Entry 1038.

295. THOMPSON, J. W. Breeding milk goats. Jour. Heredity 10: 156-160. Fig. 3-5. Apr., 1919.—See Bot. Abstr. 3, Entry 1039.

296. VAN DER WOLK, P. C. Onderzoekingen over blijvende modificaties en hun betrekking tot mutaties. [Researches on permanent modifications and their relations to mutations.] Cultura 31: 82-105. 1 pl. 1919.—New leaves formed on branches near decayed spots on a tree of *Acer pseudo-platanus*, suddenly become white, followed by the formation of wholly white-leaved branches. These abnormal leaves and branches were remarkable not only for the color of the leaves, but also for their form (with long weak tips), their leaf-stalks longer than normal and reddish with brown spots, their branches finely furrowed and more or less velvety, their strikingly short internodes, inner bark very loose around the wood, a great well-developed pith, flowers greater than usual and reddish, inflorescences with few flowers, flowers at each branch unisexual,—not polygamous, but male or female. The origin of this abnormality resulted from the presence of a certain bacillus, cultivated by the writer in pure-cultures, and called by him the "modification bacillus." A more exact description of this bacillus is not given by the author; he presents only some brief communications about some of its characteristics. This bacillus was able to penetrate the wounds of the tree, not only in branches, but also in seeds; in this last case the young plants, growing from affected seeds were from the beginning white-leaved and thus without vitality. From other observations writer had noticed the disinfecting power of calcium oxalate; therefore he has attempted to remove the infectious organism from the white branches and the affected young plants; the results were very remarkable,—though the "modification bacillus" was killed by the calcium oxalate and after the disinfection the infecting organism could no longer be found in the plant, its efficacy

was not destroyed. Newly formed leaves became white, as during the presence of the organism. Crossings made with not-disinfected flowers gave reciprocally (white male \times green female and white female \times green male) only white plants (12 and 9); crossings of normal flowers with flowers from an artificially infected inflorescence, green \times white, only green (6); white \times green, only white (7) plants. Crosses of normal flowers with flowers of disinfected white branches gave hybrids with intermediate leaf-form and spotted leaves (13).—Author discusses possibility of vegetative segregation and of analysis of a chimera, and raises the question whether mutation had been induced. Unfortunately author's plants were lost by a fatality and pure cultures of the affecting organism have not been preserved.—M. J. Sirks.

297. VAN SOMEREN, V. G. L. Melanism in Whydahs. *Avic. Mag.* 10: 40-41. Dec., 1918.—States that Jackson's Whydah and another (*Pentheria aequa*) tend to become black in captivity. The tendency is less noticeable in females than in males.—L. J. Cole.

298. VON UBISCH, G. Kritische Betrachtungen zur Hypothese der primären und sekundären Koppelung. [Critical consideration of the hypothesis of primary and secondary coupling.] *Zeitschr. indukt. Abstamm. Vererb.* 19: 193-201. 3 fig. June, 1918.—Review of papers by Trow and by Bailey on primary and secondary reduplication according to the theory of Bateson and Punnett, in which the author fails to find that the formulas of Trow agree with the observed facts in certain respects and in others are so general they do not distinguish between the reduplication hypothesis and the chromosome hypothesis of Morgan. When three factors, $A B C$, are coupled Trow's formulas allow for three different possibilities:—(1) There may occur coupling between A and C and this coupling is always the same. (2) There may sometimes occur coupling between A and C and sometimes not. (3) The coupling between A and C may vary in degree. The author points out the necessity for a closer agreement between theory and fact and states the important features of the chromosome hypothesis. In his own experience with barley 19 factor pairs are known, of which 10 up to the present have been found to be coupled, most of these being in two groups.—D. F. Jones.

299. WAARDENBURG, P. J. Aangeboren ooggebreken als oorzaak van blindheid en halfblindheid. [Half-blindness and blindness due to congenital diseases of the eye.] *Genetica* 1: 209-284. May, 1919.—A Dutch ophthalmological committee was appointed in December, 1916, to inquire concerning the causes of half-blindness and blindness of persons who were treated by oculists in 1915 and 1916. It was found that 9.2 per cent of the 881 half-blind and 14.1 per cent of the 1444 blind were suffering from congenital diseases. Author, a member of the Committee, has studied these cases (206). He found that 26.7 per cent was due to buphthalmus (increase of pressure in the eye with resultant enlargement); 19.5 per cent to atrophie retina pigmentosa (degeneration of the nervous cells of the retina); 17.9 per cent to microphthalmus and coloboma (insufficient development of the eye); 17.9 per cent to cataract (cloudiness of the lens); 7.3 per cent to atrophie nervi optici familiaris (a disease that disturbs the optic nerve generally after puberty); 5.3 per cent to albinism; 2.9 per cent to aniridia (insufficient development of the iris with resulting or accompanying disturbances); and 2.5 per cent to achromatopsia (total color-blindness).—Report is divided into 18 chapters, the first 8 of which treat the above-mentioned diseases separately. In order to appreciate fully the results author has added observations made by himself and many foreign investigators. Many interesting ophthalmological questions are mentioned; in congenital eye-diseases it often happens that the centre of the retina, the most delicate part of the eye, which is most highly organized, is affected.—Author considers heredity of paramount importance for all congenital diseases; achromatopsia and albinism appear to be recessive unit characters; the other diseases are probably polyhybrid; however they do not result from crossing of normal, but of abnormal genes. The abnormal variation of germinal factors may be due to mutation, and this possibly means that the germ is disturbed by infection products (for in many cases the author found syphilis among the causes).—In 115 families the parents were 19 times (16.5 per cent) blood-relations. In 75 families direct heredity of the diseases was seen 5 (perhaps 7) times (aniridia, atrophie nervi optici, buphthalmus, cataract, coloboma).

and microphthalmus), probably so little because marriage is rarely seen among these diseased people. Author's conclusions harmonize with the casuistic communications of heredity, etc., found in ophthalmia literature, of which the author cites many examples. 152 persons of male sex and 90 of female were affected; the difference was found especially in albinism, atrophie nervi optici, atrophie retinae pigmentosa and buphthalmus. In the final chapter author makes some remarks about prophylaxis. He reviews the dominant, gynephoric and recessive abnormal characters of the eye. He is convinced that positive eugenics can never be rational and absolutely effective, but if marriage is disadvised to sufferers from dominant diseases, and to blood-relations, and if syphilis is thoroughly combatted, the number can be fairly restricted.—P. J. Waardenburg.

300. WEATHERWAX, PAUL. Variation and varieties of *Zea Mays*. Proc. Indiana Acad. Sci. 1917: 99-103. 1918.—To show great range of variability in maize author mentions numerous contrasting characters with respect to various plant parts. The fallacy of existing system of classification, resting as it does upon merely incidental variations which happen to be for most part connected with endosperm, is pointed out. Author suggests the best taxonomic treatment would be "to consider *Zea* a monotypic genus and discard all other names than *Zea mays* L."—L. H. Smith.

301. WEATHERWAX, PAUL. Improved technique for corn pollination. Proc. Indiana Acad. Sci. 1917: 105-107. 2 fig. 1918.—Description of a device used in artificial pollination of maize for protecting the stigmas. Paraffined paper envelope is formed and attached to shoot in such manner as to permit application of pollen without removing this protecting envelope. Advantages lie in convenience of manipulation and relative freedom from contamination during the pollinating process.—L. H. Smith.

302. WEATHERWAX, PAUL. The evolution of maize. Bull. Torrey Bot. Club, 45: 309-342. 36 fig. Aug., 1918.—Rev. in: Bot. Gaz. 67: 104. Jan., 1919. [See also Bot. Abstr. 1, Entry 503; 2, Entry 76.]

303. WEATHERWAX, PAUL. The morphological basis of some experimental work with maize. Amer. Nat. 53: 260-272. May-June, 1919.—Since in Country Gentleman sweet corn a second flower, usually abortive, becomes functional, the spikelet produces two grains and, as a result of this crowding, straight rows are more or less modified for more economical space arrangements. "Genetical studies on the two-flowered condition would probably yield clearer results than genetical studies on irregularities of the rows (East and Hayes). Hermaphrodite flowers of maize are possible because the young flower contains primordia of both stamen and pistil, one or the other of which usually does not develop to maturity. The acquisition of hermaphrodite flowers of maize as the result of injury to the plant (Blaringhem) is not to be interpreted as a progressive mutation since it brings into development rudimentary organs that are vestiges of organs that have been, and are not the forerunners of organs that are to be.—B. M. Davis.

304. WHITE, E. A. Methods of rose-breeding. Amer. Rose Ann. 1918: 51-55. 7 fig. 1918.—Account of rose-breeding methods for amateurs. Details regarding best groups, ideal types, methods of growing parent plants, cross-pollination, after-treatment of crossed flowers, and sowing and care of hybrid seed are given.—Orland E. White.

305. WICKS, W. H. The effect of cross-pollination in size, color, shape and quality of the apple. Arkansas Agric. Exp. Sta. Bull. 143. 19 p., 9 pl. Mar., 1918.—Investigation during seasons of 1915, 1916, and 1917 dealt with effect of pollen upon size, shape and quality of apple. Hand pollinations were made in fertile combinations of Ben Davis, Grimes, Jonathan, and Winesap. Self-pollinated specimens were used each year as basis for comparing effect of pollen in the crosses.—From 11,290 hand pollinations 773 apples were obtained. The form and ground color of the apples of all crosses were consistently typical of the variety. Results showed necessity for cross pollination in the four varieties under test. Cross pollination

was most effective in following crosses: Ben Davis \times Grimes, Grimes \times Jonathan or Ben Davis, and Ben Davis \times Jonathan. No influence of pollen was found upon size, color, shape or quality.—*M. J. Dorsey.*

306. WINGE, Ö. On the relation between number of chromosomes and number of types, in *Lathyrus* especially. Jour. Genetics 8: 133-138. Pl. 5. Apr., 1919.—Discusses in some detail interpretation of genetic data in relation to cytological phenomena, particularly as regards chromosomes and hypothesis that number of independently segregating factor pairs in a given organism corresponds to haploid or x number of chromosomes. Preparatory to study of sweet pea (*Lathyrus odoratus*) from this standpoint, this species, together with *Lathyrus latifolius* was cytologically investigated. Haploid chromosome number for each species is 7, diploid 14. All seven chromosomes are very similar in shape and size. Character of cytological phenomena in both species is identical, preparations of one being indistinguishable from those of the other. Finds no cytological support in observations on *Lathyrus* for chiasmata hypothesis (in sense of Janssens).—*Orland E. White.*

307. WINGE, Ö. On the non-Mendelian inheritance in variegated plants. Compt. Rend. Trav. Lab. Carlsberg 14^e: 1-20. 4 fig. 1919.—Experiments with normal green and *albomaculata* variety of *Humulus Japonicus* showed that normal \times *albomaculata* gave 746 normals and 0 *albomaculata* that *albomaculata* \times normal male produced 0 normal and 35 *albomaculata*; and that *albomaculata* \times *albomaculata* gave 0 normals and 268 *albomaculata*. Mother plant proved determinative for leaf color. Results are not due to apogamy since pollination was necessary for fruiting; no data as to whether other qualities are transmitted by male. No entirely white ("albina") nor self-colored green forms occurred and author considers hereditary factors situated in cytoplasm (not including plastids); since transmission is maternal it is supposed that no cytoplasm accompanies male gamete in fertilization. Surveying work of other investigators author would explain Ikeno's results with *albomaculata* variety of *Cap-sicum annuum* as due to similar cytoplasmic determiners, but would postulate that male nucleus is accompanied by some cytoplasm. Since pure white or self-colored green forms arise in Baur's *Antirrhinum* and Corren's *Mirabilis*, author considers these variegated cases dependent on plastids (transmitted by egg) which may entirely separate out of some cells in course of ontogeny or oögenesis. Baur's *Pelargonium* case is explained by plastids transmitted by egg and male gamete. Author suggests that true heredity should be defined to include qualities having material foundation in any part of cell belonging to organism itself—nucleus, plastids, or cytoplasm. Mendelism does not include all true heredity.—*J. P. Kelly.*

308. WOODS, FREDERICK ADAMS. Kaiserism and heredity. Jour. Heredity 9: 348-353. 1 chart. Dec., 1918.—An analysis of the family tree of the Caesars, in which the tyranny and perfidy of Nero, Caligula and Agrippina "the Younger" are traced in true pedigree fashion, as such traits descend, segregate and recombine in the earlier Caesars.—*H. H. Laughlin.*

HORTICULTURE

J. H. GOURLEY, Editor

309. ANONYMOUS. Why do Japan walnuts bear butternuts? [Rev. of: WILLARD G. BIXBY. Same title. Presented at Albany, Georgia, meeting of the National Nut Growers Association.] Amer. Nut Jour. 10: 5-6. Pl. 1-5. 1919.—It has often been observed that when Japan walnuts (*Juglans sieboldiana* and *Juglans cordiformis*) are grown in the United States, the seedlings from these trees produce nuts as rough shelled as those of the butternut (*Juglans cinerea*) or even more so. The various hypotheses advanced to account for this are discussed and the conclusion is reached that it is due to hybridization with the native butternut.—*R. H. Taylor.*

310. BAILEY, HERBERT S. The production and conservation of fats and oils in the United States. U. S. Dept. of Agric. Bull. 769. 48 p. 1919.—See Bot. Absts. 3, Entry 196

311. BATES, SAM C. *Success with English walnuts in the South.* Amer. Nut Jour. 10: 27. 1919.—A brief statement of the behavior of an English walnut tree in central Alabama.—R. H. Taylor.
312. BEATTIE, W. R. *The city home garden.* U. S. Dept. Agric. Farmers' Bull. 1044. 40 p., 1 fig. 1919.
313. BOULGER, G. S. [Rev. of A. D. WEBSTER. *Coniferous trees for profit and ornament; being a concise description of each species and variety, etc., etc.* XX + 298 p. \$8 pl. Constable & Co. (Date not given.) (The title is very long, many of the chapter headings being included.)] Jour. Bot. 57: 102-103. 1919.
314. DARROW, GEORGE M. *Strawberry culture: Eastern United States.* U. S. Dept. Agric. Farmers' Bull. 1028. 60 p., 18 fig. 1919.
315. DARROW, GEORGE M. *Strawberry varieties in the United States.* U. S. Dept. Agric. Farmers' Bull. 1043. 36 p., fig. 8. 1919.
316. DEARING, CHARLES. *Muscadine grape paste.* U. S. Dept. Agric. Farmers' Bull. 1033. 18 p. 1919.
317. DRUMMOND, BRUCE. *Propagation and culture of the date palm.* U. S. Dept. Agric. Farmers' Bull. 1016. 25 p., 10 fig. 1919.
318. EDWARDS, CHAS. L. *Demand has exceeded development of seedling nuts in Texas.—now what?* Amer. Nut Jour. 10: 23-26. 1919.—Discusses the gradual destruction of the forests of seedlings pecans, and the importance of developing groves of improved varieties.—R. H. Taylor.
319. EDWARDS, CHAS. L. *Bees and grafting wax.* Amer. Nut Jour. 10: 21. 1919.—Wild and Italian bees both industriously removed grafting wax from pecan grafts even when softened with alcohol. A few drops of crude carbolic acid stirred into the wax completely prevented further loss.—R. H. Taylor.
320. EDWARDS, CHAS. L. *Walnuts in north Texas.* Amer. Nut Jour. 10: 21. 1919.—Random notes. Dormant chip budding in early spring of Mayette and Franquette walnut scions was successful on black walnut stocks. Frosts killed entire growth from the buds at end of third year and again at end of fourth year. Rush and Pomeroy varieties tested later were not killed by frosts but suffered badly from sunburn. He concludes that English walnuts will probably not prove suitable to North Texas conditions though many of the black walnut varieties are doing well.—R. H. Taylor.
321. EDWARDS, CHAS. L. *Grooming for another season.* Amer. Nut Jour. 10: 11. 1919.—Describes briefly the late winter and spring work to be done in connection with pecan propagation.—R. H. Taylor.
322. EDWARDS, CHAS. L. *Thoroughbred pecan trees.* Amer. Nut Jour. 10: 10. 8 fig. 1919.
323. FEDERAL HORTICULTURAL BOARD. U. S. DEPT. AGRIC. *Amendment No. 2 to regulations supplemental to notice of quarantine No. 37. Service and regulatory announcements 61: 33.* 1919.—See Bot. Absts. 3, Entry 400.
324. FEDERAL HORTICULTURAL BOARD. U. S. DEPT. AGRIC. *Nursery stock, plant and seed quarantine. Notice of quarantine No. 37 with regulations. Service and regulatory announcements 57: 101-110.* 1919.

325. FEDERAL HORTICULTURAL BOARD. U. S. DEPT. AGRIC. Amendment No. 1 to regulations supplemental to notice of quarantine No. 37. Service and regulatory announcements 60: 21-22. 1919. See Bot. Absts. 2, Entry 1294; 3, Entry 399.

326. GLADWIN, F. E. A test of commercial fertilizers for grapes. New York Agric. Exp. Sta. [Geneva] Bull. 458: 27-43. 1919.—These tests show that nitrogen, phosphorus and potassium have had a marked beneficial effect upon wood growth, yield and quality of fruit. The data indicate that of the three elements nitrogen has been most helpful. Potassium has given more pronounced results than phosphorus up to the present, although the latter has had a more beneficial effect upon the green-manure crops in the vineyard. Nitrogen has not only affected favorably the growth of wood, but it has increased the fruit and given larger berries and clusters. Phosphorus and potassium have increased the production of wood and fruit, but have not influenced the quality of the fruit to the same extent as the nitrogen. Potassium has caused earlier ripening of the foliage than the other elements. Even though the same number of canes be tied up for fruiting purposes, the data show that the fertilizer plats have produced a decided gain of fruit over the unfertilized. The foliage, after the first few years, has been of better color and size in the plats to which nitrogen was applied while the phosphorus and potassium plats ranked second and the check plat a poor third.—F. E. Gladwin.

327. GOULD, H. P., AND GEORGE M. DARROW. Growing fruit for home use. U. S. Dept. Agric. Farmers' Bull. 1001. 40 p., 26 fig. 1919.

328. GOULD, H. P. Fig growing in the South Atlantic and Gulf States. U. S. Dept. Agric. Farmers' Bull. 1031. 47 p., 24 fig. 1919.

329. HADLEY, O. M. Improved methods in pecan propagation. Amer. Nut. Jour. 10: 4. 1919.—A general discussion is given of root pruning of nursery trees to secure better root systems for transplanting, and its relation to pecans. This is followed by a discussion of the possible desirability of double-working pecan varieties to overcome differences in growth. The claim is made that the effect of scion on stock is very pronounced. Observation of over 100 trees each of Delmas and Moore in north Florida shows that the former makes a vigorous stocky growth and an unusually fine root system, while the latter makes a decidedly less vigorous and very much inferior root system. The belief is expressed that the difficulty with the Moore could be largely overcome by double-working on the Delmas to give increased vitality. This is based on experiments with double-working the Schley, Pabst and Money on Delmas, the results being entirely satisfactory in every case. It is believed that this practice will prove to be commercially profitable.—R. H. Taylor.

330. HEADLEE, THOMAS J. Control of the principal insects injurious to the apple above ground. Massachusetts State Dept. Agric. Circ. 9. 11 p. 1919. [Reprinted without change in: Massachusetts Fruit Growers' Assoc. Ann. Rept. 1919] This is a popular summary of the most recent methods of spray control of apple insects in the northeastern United States.—J. K. Shaw.

331. HEDRICK, U. P. Factors affecting hardiness in fruits. Massachusetts State Dept. Agric. Circ. 6. 10 p. 1919. [Reprinted without change in: Massachusetts Fruit Growers' Assoc. Ann. Rept. 1919].—This is a popular discussion of winter injury to fruit trees and means of avoiding it.—J. K. Shaw.

332. JORDAN, W. H. Director's report for 1918. New York Agric. Exp. Sta. [Geneva] Bull. 457. 26 p. 1918.—See Bot. Absts. 3, Entry 856.

333. ORIS, A. W. Fruit market possibilities in the export trade. Massachusetts State Dept. Agric. Circ. 7. 7 p. 1919. [Reprinted without change in: Massachusetts Fruit Growers' Assoc. Ann. Rept. 1919].

334. POPENOE, WILSON. The Tavoado in Guatemala. U. S. Dept. Agric. Bull. 743 69 p., 23 pl. 1919.—This bulletin gives the result of studies in the avocado plantings of Guatemala. The author states that probably in no other country are so many fine avocados grown. Information is given on the extent of the industry, the uses made of the crop and the climatic zones in which avocados are found to thrive. The author says that it is possible that the types, which should better be termed races, may have been derived from distinct species, but the wild prototype has not been found. The three races described are the Guatemalan, the West Indian and the Mexican. Information is given concerning the origin of choice varieties and a considerable number of varieties are described. Practical information is also given as to cultural methods and marketing.—W. H. Chandler.

335. RIEHL, E. A. Profitable chestnut growing. Amer. Nut Jour. 10: 27. 1919.—A brief statement of best varieties now available. Figures on production in pounds for the first 16 years of the life of a Boone chestnut are given.—R. H. Taylor.

336. VAN THUMP, S. H. English walnut in Marion County, Oregon. Amer. Nut Jour. 10: 13. 1919.

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, Editor

337. BROWN, FOREST B. H. The preparation and treatment of woods for microscopic study. Bull. Torrey Bot. Club 46: 127-150. Fig. 1-6. 1919.—An investigation of the woods of Hawaii led to the development of special technique for sectioning many of the hard tropical woods. Information is presented as to use of microtome and knife. For sectioning, blocks should be cut true. Air can be removed by alternate boiling and cooling, and for softening hard woods it is safe to use strong hydrofluoric acid, which can be removed by washing for 4 days in running water; then blocks can be soaked in glycerine. Instructions are given for imbedding in celloidin where this process is necessary. In using Schultze's method for maceration, equal volumes of acid and water should be used for safety. For differential staining, Haidenhain's iron-haematoxylin is recommended with a counter stain of safranin; for soft cellulose tissues of bark Congo red is better than safranin. Microchemical reactions are given for cellulose, cellulose-lignin, gums, mucilaginous layers, essential oils, resins, gum resins, fats, tannin, mineral crystals; and for chemical growth-rings when structural growth-rings are lacking. Liquid penetration tests are of use for ascertaining the presence of tyloses and gums.—P. A. Munz.

338. COLANI, M. Recherches sur les premières phases du développement de quelques Combretacées et Barringtoniées. [Early stages of development of some Combretaceae and Barringtoniaceae.] Thesis, Fac. Sci. Univ. Paris, 1914. [Through bibliographical note by A. P. ALLORGE, in: Rev. Gén. Bot. (Paris) 30: 301. 1918.]—The Combretaceae studied (*Terminalia Catappa* Willd., *T. chebula* Willd. and *Poirrea* sp.) are characterized by a slight growth in length of the hypocotyl and a considerable elongation of the radicle. Germination in the case of *Barringtonia speciosa* Willd. is similar to that characteristic of certain Myrtaceae in the fact that there are no cotyledons, their function being assumed by the hypocotyl. The cells of the hypocotyl are hypertrophied, and there is a considerable development of woody tissue in the radicle. The cellular differentiation, first of the radicle, then of the plumule (in *Barringtonia*), occurs during germination in the tissues of the hypocotyl.—C. E. Allen.

339. GUÉRIN, PAUL. Développement de l'anthere et du pollen des Labiées. [Development of the anther and pollen in the Labiatae.] Compt. Rend. Acad. Sci. Paris 168: 182-185. 1919.—The work of Warming on *Mentha aquatica* L. and of the author on the sages is believed to be the only published work on the development of the anther and pollen in the Labiatae.

In order to secure a more complete knowledge of anther and pollen formation in this family, 60 species belonging to 40 genera were studied. Brief note is made of the method of development of the pollen sacs, the pollen mother cells, the "nourishing tissues" and the anther walls. The reduction division forming the pollen grains is not different from that found in other plant groups.—V. H. Young.

340. ROSENDALH, C. O. Variations in the flowers of *Erythronium propullans* Gray. *Torreyia* 19: 43-47. Fig. 1-3. 1919.—The stamens in this very local species show marked heteromorphism, those of the outer whorl averaging 6.32 mm. in length, of the inner 7.99 mm. Considerable variation in the size of the anthers is also noticed, but unrelated to the filament-length. The number of perianth-segments varies from 6 to 4, of stamens from 6 to 2. In the trimerous flowers the ovary is 3-celled, in the tetramerous 2-celled. The flowers are smaller than in any other species of the genus, probably due to a diversion of food-supply into the offshoot.—J. C. Nelson.

MORPHOLOGY AND TAXONOMY OF FUNGI, BACTERIA AND MYXOMYCETES

EDGAR W. OLIVE, *Editor*.

341. ANONYMOUS [B. O. DODGE]. Index to American mycological literature. *Mycologia* 11: 97-100. 1919.

342. ANONYMOUS [B. O. DODGE]. Index to American mycological literature. *Mycologia* 11: 158-161. 1919.

343. ARNAUD, G. Fumigines du Midi de la France. [The sooty molds of southern France.] *Bull. Soc. Path. Vég. France* 4: 95. 1918.—*Capnotium meridionale* with perithecia is reported on branches of *Oleo europea* and *Ceratocarpia cactorum* with perithecia on branches of *Ficus carica* and *Citrus aurantium*. The fungi were associated with scale insects on all the hosts.—C. L. Shear.

344. ARTHUR, JOSEPH CHARLES. New species of Uredineae—XI. *Bull. Torrey Bot. Club* 46: 107-125. 1919.—*Puccinia wyomensis* Arthur and *P. missouriensis* Arthur are reduced to synonymy. The following new names are proposed: *Puccinia egressa* for *P. egregia* Arth. 1911, *Puccinia (?) fuirenicola* for *Uredo Fuirenae* P. Henn. 1899, *Puccinia (?) Scribnerianum* for *Uromyces Aristidae* Ellis and Ev. 1887, *Puccinia pallescens* for *Uredo pallida* Diet. and Holw. 1897, *Puccinia imposita* for *Uredo Muhlenbergiae* Diet. 1897, *Uromyces Shearmanus* for *U. Atriplicis* Arth. 1918. *Uredo Kaernbachii* P. Henn. 1894 is changed to *Puccinia Kaernbachii* (P. Henn.). The following new species are described: *Puccinia Cockerelliana* Bethel, P. *indita*, P. *Coelopleuri*, P. *parca*, P. *gentilis*, P. *prospera*, P. *massalis*, P. *invelata* Jackson; *Uredo biporula*, U. *amica*, U. *ignava*; *Aecidium Clemensae*, A. *Bourreriae* Holway, A. *Chamaeristae*, A. *modestum*, and A. *ingenuum*.—P. A. Muns.

345. BATCHELOR, MARJORIE DIETZ. Aerobic spore-bearing bacteria in the intestinal tract of children. *Jour. Bact.* 4: 23-24. Pl. 1-8. 1919.—The author reports the different species and the frequency of each species of aerobic spore-bearing bacteria found in the dejecta of over fifty children. Five new species are described, including *Bacillus badius*, *Bacillus fusus*, *Bacillus tritus*, *Bacillus lautus*, *Bacillus flexus*.—Chester A. Darling.

346. BEACHE, WALTER SPURGEON. Biologic specialization in the genus *Septoria*. *Amer. Jour. Bot.* 6: 1-33. Pl. 1, 15 diagrams, 4 tables, 1 graph. 1919.

347. BENSAUDE, MATHILDE. Recherches sur le cycle évolutif et la sexualité chez les basidiomycètes [Researches on the life cycle and sexuality in Basidiomycetes]. 158 p., 13 pl., 30 fig. Nemours, 1918.—*Coprinus fimetarius* Fr., *Armillaria mucida* Schrad., and *Tricholyma*

nudum Bull., are the mushrooms studied. The author considers Bouin's picro-formol the most satisfactory fixing agent and iron haematoxylin counter stained with eosin, fuchsin, and light green as the best stains. The work is divided into two phases; the first deals with the morphology and cytology of the mycelia and the second treats of results obtained from the study of single spore cultures of *Coprinus fimetarius*.—The mycelia of the three species of fungi Miss Bensaude studied were obtained from germinating spores as well as from material collected in the field. The author accepts R. Falck's classification of the mycelia into primary, secondary, and tertiary forms. The claim is made that the first few days after the germination of the spores in *Coprinus* the resulting mycelia belong to the primary class in which the hyphae are partitioned off into cells which contain from one to many nuclei. These uninucleated cells may give rise to varying numbers of uninucleated oidia.—Disarticulated hyphal cells which she calls "pseudoidia" are also formed which may germinate like true oidia. The nuclei in the germ tubes apparently divide amitotically.—Cross walls with clamp connections never appear in the hyphae of the primary mycelia. Miss Bensaude grew single spores of *Coprinus fimetarius* in pure cultures. She succeeded in isolating single spores. In two cultures of these, abundant mycelium was produced, which remained primary and did not produce carpophores. When parts of each mycelium were mixed in a culture, a secondary mycelium appeared and fruit bodies were produced. The chief method of bringing about the plasmogamy seems to be through the union of a hyphal cell of one thallus with an oidium from another thallus, although it may be brought about by the anastomosis of two hyphal cells of different thalli in *C. fimetarius*. Miss Bensaude thus concludes that the "dicaryon" in *C. fimetarius* is formed following plasmogamy between cells coming from two different thalli.—The transformation of a primary mycelium into a secondary mycelium is very difficult to observe. The fusion of two cells (plasmogamy or pseudogamy) introduces the cytoplasm and nucleus or nuclei of one cell into the other. This results in the establishment of a binucleated cell. If two cells unite which have more than two nuclei in common, all disintegrate but two. The uninucleated oidium may fuse with a hyphal cell and this is a very common means of bringing about the initial binucleated condition of the cell.—Each cell in these secondary hyphae is binucleated, constituting a "dicaryon." Conjugate nuclear division occurs in these hyphae as a rule in the apical cell, although intercalary cells divide occasionally. At the time of division the two nuclei move to the middle of the cell and the actual process of cell division is preceded by the formation of a protuberance which is to form a clamp. One of the nuclei which Miss Bensaude calls +, on the basis of her results with single spore cultures, enters this very short branch and the — nucleus remains at about the same level in the mother cell. Spindles are formed and conjugate nuclear division takes place. One of the + daughter nuclei goes back into the mother cell and the other goes to the apex of the young clamp. A cross wall cuts off the beak cell from the mother cell. Of the two — daughter nuclei, one goes to the apical part of the mother cell and the other to the basal part, and a cross wall is formed at the level of the young clamp dividing the cell into an apical portion with + and — daughter nuclei and a basal cell with only the — daughter nucleus. The little beak now fuses with the basal cell and its nucleus passes into this cell so that it also becomes binucleated. Very often the apex of the beak fuses with the mother cell before nuclear division takes place.—Reversion of secondary to primary mycelium occurs, in which case a uninucleated cell appears among binucleated cells. No clamps are found on the cross walls of this cell. These uninucleated cells may bear oidia. [See Bot. Absts. 3, Entry 507.]—*Michael Levine.*

348. BURT, E. A. The Thelephoraceae of North America. IX. *Aleurodiscus*, Ann. Missouri Bot. Gard. 5: 177-203. 1918.—Fourteen species are included. It is pointed out that the limits of the genus are indefinite. The species are characterized especially by unusually large basidia and by noteworthy paraphyses. [See Bot. Absts. 1, Entry 774.]—*H. M. Fitzpatrick.*

349. BURT, E. A. The Thelephoraceae of North America. X. *Hymenochaeta*. Ann. Missouri Bot. Gard. 5: 301-372. 1918.—Thirty-six species are recognized for North America. The genus is characterized primarily by the possession of "slender, somewhat conical colored

setae between the basidia." The form of the fruit body varies from stipitate to resupinate. Emphasis is placed upon the fact that a single species may vary greatly in habit and form depending upon its position on the substratum. A species may be resupinate on the under side of a log and reflexed when developed up its side. Attention is called to the fact that the species of this genus possess a chemical substance in the tissue of the fruit body which causes an immediate darkening of sections when potassium hydrate is brought in contact with them. The genus is subdivided into two groups of species. In one group the setigerous tissue is seated directly on the substratum. In the other a hyphal layer destitute of setae lies between the substratum and the setigerous layer.—H. M. Fitzpatrick.

350. CHENANTAIS, J. E. Trois *Discomycètes*. [Three *Discomycetes*.] Bull. Trimest. Soc. Mycol. France 34: 34-40. Pl. 3. 1918.—The author describes three *Discomycetes*, *Acophanus Holmakhjoldii*, *Hyalinia Ulicis*, and *Pithyella harnata*.—Fred C. Werkenhlin.

351. CHENANTAIS, J. E. Étude sur les *Pyrénomycètes*. [A study of the *Pyrénomycetes*.] Bull. Trimest. Soc. Mycol. France 34: 47-73. Fig. 1-5. 1918.—The author comes to the conclusion that the exterior distinction upon which the genera *Caelosphaeria* and *Nitschkia* are based are of no value. *Nitschkia tristis* and *Nitschkia collapsa* constitute only two forms of the same genus.—Fred C. Werkenhlin.

352. CONN, H. J., AND J. W. BRIGHT. Ammonification of manure in soil. Jour. Agric. Res. 16: 313-350. 1919.—See Bot. Abstr. 3, Entry 850.

353. DAVIS, W. H. The aecial stage of alsike clover rust. Proc. Iowa Acad. Sci. 24: 461-477. 1917 (1918).—A rust of the genus *Uromyces* is prevalent in this latitude on the common clovers, such as *Trifolium repens*, *T. pratense*, and *T. hybridum* (alsike). Evidence is given to show that pycnia and aecia are developed on the leaves of alsike clover. Comparison of the aecia and pycnia of the rust on *T. hybridum*, with that on *T. repens* and *T. pratense*, shows that they are not the same.—Cross inoculations with any of the spore forms of alsike clover rust show that this rust will not cause infection on red clover, white clover, mammoth clover, crimson clover, alfalfa, or white melilot. The rust of alsike clover is shown to be long cycled, autoecious, having all the spore forms. A morphological difference is evidenced by measurements. The causal organism is *Nigredo hybridi* Davis; Otherwise, *Uromyces hybridi* Davis.—I. E. Melhus.

354. DUROUR, LÉON. Note sur le mode de végétation du *Plicaria leioarpa* Currey. [Method of forming fruiting bodies by *Plicaria leioarpa* Currey.] Bull. Trimest. Soc. Mycol. France 34: 31-33. 1918.—The author gives a detailed description of the formation of fruiting bodies of *Plicaria leioarpa*.—Fred C. Werkenhlin.

355. DUPRENOY, J. Les conditions écologiques du développement des champignons parasites.—Étude de géographie botanique. [Ecological relations of the development of parasitic fungi.] Bull. Trimest. Soc. Mycol. France 34: 8-26. 1918.

356. ERIKSSON, JACOB. Zur Entwicklungsgeschichte des Spinatschimmels (*Peronospora spinaciae* (Grew.) Laub.) [Life history of *P. spinaciae*.] Ark. för Bot. 15^u: 1-25. Pl. 4, 3 fig. 1918.—The fungus is widely distributed geographically. It has been confused with *P. effusa* on *Chenopodiaceae* but it is morphologically as well as physiologically different.—Large spots appear on the young leaves of spinach (*Spinacia oleracea*) which are yellowish to white above and gray-blue beneath from conidiophores. Later the whole leaf is involved.—Most investigators have denied the presence of oospores in *P. spinaciae*. Accordingly a cytological study of the development cycle of the organism was undertaken. Leaf tissue from a healthy plant was compared with apparently disease-free leaf tissue of a plant showing the disease in its primary stage on certain leaves. No trace of mycelium could be found in either, but certain rather pronounced differences were observed in cell structure. These are illustrated by photomicrographs. Bodies resembling chondriosomes and mitochondria were

observed which are thought to be pathological manifestations, i.e., *mycoplasma*.—After the two growth phases in the host have passed there comes a time when the fungus gains supremacy. Anatomically this is manifest in the dissolution of the chlorophyll granules. Nucleoli of the various sizes appear and mark the end of the mycoplasma stage. Soon the typical hyphal bodies become evident first within the cell and later in the intercellular spaces.—Anthridia and oögonia are formed on the intercellular mycelium and fusion stages are shown. Oospores develop. They can be found in dead tissue mostly singly in the spongy parenchyma or near the lower epidermis.—The oospores germinate immediately. The germ tube issues from a stomata and, remaining simply or becoming branched, produces spores which function as zoosporangia.—The return of the fungus to the mycoplasma stage remains to be investigated.—D. Redlick.

357. GROVE, OTTO. A rosy cedar bacillus. Ann. Rept. Agric. and Hort. Res. Sta. Univ. Bristol. 1917: 15-17. 1918.—See Bot. Absts. 3, Entry 455.

358. JENKINS, ANNA E. Brown canker of roses, caused by *Diaporthe umbrina*. Jour. Agric. Res. 15: 593-600. Pl. D and 46-47. 1918.—The causal organism is described as new under the name *Diaporthe umbrina*. [See Bot. Absts. 2, Entry 788.]—H. M. Fitzpatrick.

359. JOEL, MILLA. [Pythium conidiophorum nov. sp., ein Parasit von Spirogyra.] Österr. Bot. Zeitschr. 67: 33-37. 1 pl. 1918. [From abstr. by Matoušek in Zeitschr. Pflanzenkr. 28: 344. 1918.]

360. JORDAN, W. H. Director's report for 1918. New York Agric. Exp. Sta. [Geneva Bull. 457: 1-25. 1918.—See Bot. Absts. 3, Entry 856.]

361. JUILLEARD, M. G. Deux Bolets rares. [Two uncommon Boleti.] Bull. Trimest. Soc. Mycol. France 34: 2-7. Pl. 1-2, colored. 1918.—The author describes two rare Boleti, *Boletus calopus* Fr. and *Boletus olivaceus* Schaef.—Freil. C. Werkenh.

362. KOCH, G. P., AND J. R. BUTLER. Cross inoculation of legumes. Soil Sci. 6: 397-403 1918.—*Bacillus radicicola* isolated from the roots of alfalfa, sweet clover and burr clover all cross-inoculate. Organisms isolated from any one of the 4 clovers, crimson, alsike, red and white produced a vigorous nodule formation by cross inoculation. The organisms of garden peas, vetch, Canada field peas, and sweet peas also cross-inoculate.—J. J. Skinner.

363. LLOYD, C. G. Mycological notes, no. 54. P. 768-780, fig. 1149-1174. Cincinnati, 1918.—The cover of this number bears the photograph of Professor Thomas H. Macbride, accompanied by a brief expression of personal appreciation. Photographs and notes on the following fungi are given: *Cordyceps sinensis*, *Xylaria tuberculosa*, *X. polymorpha*, *X. fusca*, *X. stromatica*, *X. gracillima*, *Camillea (?) sulcata*, *Scleroderma sinnamariense*, *Trametes argyropolamica*, *Baeomyces roseus*, *Polyporus mycelodes*, *Trametes pusillus*, *Eridia wuapassa*, *Cladoderis thwaitesii*, *Fomes marginatus*, *Irpex subcoriacea*, *Pleurotus sapidus*, *Camillea bombia*, *Isaria sphecocephala (?)*, and *Sebacina spongiosa*. Comments by correspondents on "Mycological Myths" are appended. A short account is given by N. Gist Gee of the history of *Cordyceps sinensis* in Chinese medicine and pharmacy. This plant is the celebrated "Chinese plant worm" of Chinese materia medica.—H. M. Fitzpatrick.

364. LLOYD, C. G. Mycological notes, no. 55. P. 782-796, fig. 1175-1199. Cincinnati, 1918.—The photograph of Mr. John Dearness appears on the cover of this number, and is accompanied by a brief biographical sketch. The genus *Auricularia* is discussed, and a list of the species regarded as worthy of recognition is given. Only eight of the seventy-two named species are re-recognized. Photographs and notes are given for *A. auricula Judae*, *A. Moellerii*, and *A. delicata*. Three species of *Stereum* having dark, seal-brown, pubescent pilei are figured and discussed. These are *S. illudens*, *S. deceptivus*, and *S. Phocg*. "Rare and interesting fungi received from correspondents" include the following species: *Polyporus Wilsonianus*, *Serotium pedunculatum*, *S. tenuipes*, *S. russuloides*, *S. australe*, *Mucronella tenuipes*,

Tremella fuciformis, *Polystictus cladophorus*, *P. anomalous*, *Irpez versatilis*, *I. vellereus*, *Polystictus imbricatus*, *Lysurus Gardneri*, *Polyporus tsunodae*, *Pterula mannii*, *Tremella frondosa*, *Geaster clelandii*, *Irpez cingulatum*, *Lycoperdon pisiforme*, and *Lentinus fasciatus*. Notes and photographs are given for all of these. Attention is called to the pseudosclerotia produced by the last named species.—H. M. Fitzpatrick.

365. LLOYD, C. G. *Xylaria Notes*, no. 1. P. 1-16, fig. 1800-1836. Cincinnati, 1918.—The author is now interesting himself in those Ascomycetes which have a large fruiting structure. He desires that collectors send these to him, and he asks here especially for material of *Xylaria*. In this paper he discusses the problems which confront the student undertaking monographic work in this group, and states that much of the systematic work on *Xylaria* has been inaccurately done. In certain species of *Xylaria* the interior of the stroma disappears leaving the center of the club hollow. These species are here discussed as "the hollow *Xylarias*." Approximately fifteen species are figured and described. Notes and photographs are also given for other interesting species of *Xylaria* received from correspondents. These include *X. Ridleyi*, *X. discoidea*, *X. mellisti*, *X. ectogramma*, and *X. pomphus*. *Isaria flabelliformis* is figured and its possible connection with *Xylaria corniformis* is discussed.—H. M. Fitzpatrick.

366. LLOYD, C. G. *Xylaria Notes*, no. 2. P. 17-32, figs 1324-1357. Cincinnati, 1918.—Notes and figures of the following species are given: *Xylaria castorea*, *X. chordaeformis*, *X. pistillaris*, *X. filiformis*, *X. apiculata*, *X. arbuscula*, *X. herculea*, *X. scruposa*, *X. anisopleura*, *X. torquescens*, *X. cookae*, *X. multipler*, *X. obesa*, *X. lancea*, *X. luxurians*, *X. bipindensis*, *X. pallide-ostiolata*, *X. moriformis*, *X. faveolis*, and *X. cristulata*. The possible connection of *Isaria flabelliformis* with *X. corniformis* is discussed.—H. M. Fitzpatrick.

367. LLOYD, C. G. *Mycological Notes*, no. 56. P. 798-812, fig. 1259-1268. Cincinnati, 1918.—The title page of this number bears the photograph of Doctor George A. Rex. An accompanying note makes reference to the value of his work in American Myxomycetes, and contains a brief account of his life. The fungi discussed in the number were in most cases received from Brazil. Of these may be mentioned *Rickella transiens*, *Geaster stipitatus*, *Hydnum rillipes*, *Polyporus inopinus*, *Rimbachia cyphelloides*, *R. vitellina*, *Ducryomitra depalensis*, *Geaster trichifer*, and *Polyporus humilis*. The genus *Endogone* is briefly discussed and *E. tuberculosa* is described and figured. *Sarcosphaeria coronaria* is figured and discussed. A collection made by S. H. Burnham in New York is regarded as the first American collection of this species. *Cordyceps ophioglossoides* is said to occur on a locust in Japan. Notes and photographs are also given for the following: *Lenzites beckleri*, *Isaria cosmopsaltrias*, *Stereum plicatum*, *Polyporus salebrosus*, *Auricularia Hunterii*, *A. delicata*, *Merulius castaneus*, *Podocrea cornu-damae*, *Polyporus profusilis*, *P. antilopus*, *Lenzites glabra*, *L. ungulaeformis*, and *Polyporus conjunctus*.—H. M. Fitzpatrick.

368. MOREAU, FERNAND. La biomorphogénèse chez les lichens. [Biomorphogenesis of lichens.] Bull. Trimest. Soc. Mycol. France 34: 84-85, 1918.—The author shows that biomorphogenesis is found in Lichens. In his first chapter, entitled Biomorphogeny brought about by a foreign alga within the gonidial layer of Lichen, he states that within the outer or inner surface of the Peltigeraceae a green alga oftentimes produces knots, which are known as cephalodia. These cephalodia consist of a mixture of algal cells and fungal filaments, similar to the gonidial layer. Biomorphogenesis is evident in this case. In his second chapter the author shows how biomorphogeny is brought about by the alga within the gonidial layer.—Fred C. Werkenthin.

369. MOLLIARD, MARIN. Production d'acide citrique par le *Sterigmatocystis nigra*. [Production of citric acid by *Sterigmatocystis nigra*.] Compt. Rend. Acad. Sci. Paris. 168: 360-363. 1919.—Sée Bot. Absts. 3, Entry 445.

370. PATOUILLARD, N. Quelques champignons de Madagascar. [Several fungi from Madagascar.] Bull. Trimest. Soc. Mycol. France 34: 86-91. Fig. 1. 1918.—On a botanical collecting trip in Madagascar a number of fungi were collected by Viguiet in 1912, some of which are interesting enough to be mentioned here. *Trematophyella Leptodesmias* n. gen. and n. sp., *Gymnoconia Althemillas* n. sp., *Limacinula cupularis* n. sp., *Meliola amphitricha* Fr. var. nov. *pungens*, *Sphaerella Hydrocotyles-asiaticae* n. sp., *Othia deformans* n. sp. causing tumors on limbs on small branches of *Philippia*, *Ophiobolus Coffeae* n. sp., and *Sepatoria mellispora* n. sp.—Fred C. Werkenthin.

371. PETRONEL, B. Secondo elenco di funghi di Val S. Martino o Valle della Germanasca. [Second contribution on fungi of San Martino.] Nuovo Gior. Bot. Ital. 25: 146-192. 1918.—The author deals primarily with the Basidiomycetes (Agaricaceae and Polyporaceae especially) listing only such species which could be identified with certainty. In case where previous descriptions proved inadequate or misleading, a short description is given, special emphasis being laid on points of taxonomic importance. The author also notes elevation above sea level, exact location, and habitat for each species. Of the 128 species treated, 72 are new for that region and one, *Boletus laricinus*, is new for Italy.—Ernst Ariaschwager.

372. PIERRE, H. Superposition de deux Russules.—*Russula olivacea* Schoeff. [Superpositions of two Russulae.] Bull. Trimest. Soc. Mycol. France 34: 74-75. Fig. 1. 1918.—The author distinguishes between two Russulae, one characterized by being markedly concave, and by having a diameter of 16 cm., while the other is much smaller, only 3.5 cm., and distinguished by intimately adhering to the summit of the pileus which is expanded.—Fred C. Werkenthin.

373. PIERRE, M. H. Nouveau cas de rubéfaction de la face, survenu à la suite de l'ingestion du *Coprinus atramentarius*. [A new report of rubefaction of the face caused by eating *Coprinus atramentarius*.] Bull. Trimest. Soc. Mycol. France 34: 28. 1918.

374. SPEGAZZINI, C. Revision de las Laboulbeniales Argentinas. [Revision of the Laboulbeniales of Argentina.] An. Mus. Nacion. Hist. Nat. Buenos Aires 29: 445-688. Fig. 1-213. 1917.—This is a continuation and revision of the author's work "Laboulbeniales Argentinas" which appeared in 1912. It is divided in two sections. The first section is general and gives methods for the collection of the forms and of the hosts on which the forms are found, methods of conservation, methods of mounting for permanent collections, of separation from the hosts and methods of staining. This section also includes a general review of the morphology and life cycle of the Laboulbeniales. Methods for the artificial cultivation are also given. The second section is concerned chiefly with the description of species and diagnostic notes with careful notes as to the hosts on which the various forms were found. Keys to the families are appended. Out of the 213 species described 90 are new species and a few are new forms.—A. Bonazzi.

375. STEVENSON, JOHN A. A check list of Porto Rican fungi and a host index. Jour. Dept. Agric. Porto Rico. 2: 125-264. 1918.

376. TROTTER, A. La "rabbia" o "antracnosi" del cece ed il suo produttore. [Rabbia or anthracnose of chick-pea and its cause.] Rivist. Patol. Veg. 9: 105-114. 1918.—An outbreak of the "rabbia" or anthracnose of the chick pea (*Cicer arietinum*) on the farm of the School of Viticulture at Avellino led to a new systematic study of the fungus causing this disease, already long known. The fungus previously known as *Zythia rabiei*, *Phyllosticta cicerina* and *Ascochyta pisi* is given the name *Phyllosticta rabiei* (Passerini) Trotter.—F. M. Blodgett.

377. VAN DER BIJL, PAUL A. Ring spot of cane leaves. South Africa Dept. Agric. Bull. 10: 15-18. Fig. 7. 1918.—Brief description of *Leptosphaeria sacchari* in the leaves of sugar cane. The illustration shows the perithecia to be deeply imbedded and amphigenous.—D. Reddick.

378. VUILLEMIN, PAUL. Un nouvel *Aspergillus* brun, *Eurotium verruculosum*. [A new brown *Aspergillus*, *Eurotium verruculosum*.] Bull. Trimest. Soc. Mycol. France 34: 78-83. Fig. 1-4, 5-17. 1918.—The author describes *Eurotium verruculosum*, a new species, isolated from spoiled carrots, to be distinguished from *Eurotium echinulatum* by not having brown appendages on the surface of the perithecia, and not having echinulate ascospores and conidia.—Fred C. Wentworth.

379. VUILLEMIN, PAUL. Sur les *Mortierella* des groupes *polycéphala* et *negrescens*. [A discussion of *Mortierella polycéphala* and *Mortierella negrescens*.] Bull. Trimest. Soc. Mycol. France 34: 41-46. Fig. 1-5. 1918.—The author discusses and describes in detail *Mortierella polycéphala* and *Mortierella negrescens*, using three text figures to illustrate various points in the development of the first mentioned fungus.—Fred C. Wentworth.

380. WAKEFIELD, E. M. Fungi exotici. XXIV. Kew Bull. Misc. Inf. 1918: 207-210. 1918.—The following new species are described: *Fomes elegans* on living *Shorea robusta* from India, *F. pseudo-ferreus* on diseased roots of *Hevea brasiliensis* from Federated Malay States, *Aleurodiscus australiensis* from Australia, and the following from Tropical Africa: *Puccinia coreopsideis*, *Eutypella theobromicola*, *Rosellinia asperata*, *Septoria coffeae*, *Hendersonia protearum*, *Cercospora latimaculans*.—D. Reddick.

381. WAKEFIELD, E. M. New and rare British fungi. Kew Bull. Misc. Inf. 1918: 229-233. 1918.—New species are *Leptota nauseosa*, *Nectria fusco-purpurea*, *Cercospora antirrhini* on living leaves and stems of *Antirrhinum*, *Helminthosporium warpuriae* on an injured stem of *Warpuria clandestina*.—Critical notes and descriptions of the following: *Merulius pinastri*, *Lysurus borealis*, *Mastigosporium album* var. *muticum*.—D. Reddick.

382. WAKSMAN, SELMAN A., AND ROLAND E. CURTIS. The occurrence of actinomycetes in the soil. Soil Sci. 6: 309-319. 1918.—See Bot. Absts. 2, Entry 1342.

PATHOLOGY

DONALD REDDICK, Editor

383. ANONYMOUS. The control of pests of fruit trees in gardens and small orchards. Jour. Bd. Agric. [London] 25: 41-53. 3 fig. 1918. Also issued as Food Production Leaflet No. 39.

384. ANONYMOUS. Field experiments, 1918. Jour. Dept. Agric. Ireland 19: 180-208. 1919.—See Bot. Absts. 3, Entry 195.

385. ANONYMOUS. Analyses of materials sold as insecticides and fungicides. New York Agric. Exp. Sta. [Geneva] Bull. 454. 15 p. 1918.—Chemical analyses of various brands of insecticides and fungicides sold in the state of New York.—F. C. Stewart.

386. ANONYMOUS. Practical hints on potato spraying. Jour. Bd. Agric. [London] 25: 198-203. 1918. Also published as Food Production Leaflet 43.—Prices of vitriol and soda, list of vendors, care and use of spraying machines, formulae, spraying dates for the various counties.—D. Reddick.

387. BALL, E. D. The potato leafhopper and its relation to the hopperburn. Jour. Econ. Entomol. 12: 149-155. Pl. 5, fig. 7. 1919.—Results of study of hopperburn of the potato, *Solanum tuberosum* induced by the activities of the potato leafhopper, *Empoasca mali*. For the most part an entomological study and discussion of the disorder, however, discussing its relation to tipburn attributed to excessive transpiration. "I am with the plant pathologist in saying that there is no question but what some of the things they called tip-burn in the past were not this, but a large part of it was this." It is thought that the injury is not

mechanical but specifically, an infection or an injection. Control consists in applying a contact spray, as blackleaf 40, taking care to reach the lower surface of the leaves. Hepperburn occurs on other plants, as nursery stock, young apple trees, growing tips of raspberries etc.—A. B. Massey.

388. BOARD OF AGRICULTURE, GREAT BRITAIN. Potato spraying campaign. Jour. Bd. Agric. [London] 25: 1004. 1918.—In the 10 months—November 1, 1917 to August 1, 1918—over 14,500 knapsack and other spraying machines were bought in Great Britain for the purpose of spraying potatoes. Between November 1, 1916 and August 1, 1917, 12,000 machines were bought. Previous to a campaign of the Food Production Department, the yearly average was less than 1000 machines.—In a demonstration experiment at Christchurch, blight was general on unsprayed plots on August 22 whereas on the sprayed plots it did not become general until September 17.—At digging time rod rows yielded healthy tubers as follows: sprayed, 345 pounds; unsprayed, 226 pounds.—D. Reddick.

389. BOARD OF AGRICULTURE, GREAT BRITAIN. The wart disease of potatoes order of 1918. Jour. Bd. Agric. [London] 25: 212-215. 1918.—Infected area is defined. No person in infected area shall plant potatoes not of a variety approved by the board as immune to wart disease.—Sale of immune varieties for seed purposes is restricted by license.—Potatoes from infected areas are not to be used for planting outside the area.—Owners discovering the disease are required to report it.—Tubers visibly affected are not to be sold for any purpose.—Inspectors have right of search and may order potatoes destroyed if conditions warrant.—D. Reddick.

390. BYARS, L. P. A serious eelworm or nematode disease of wheat. U. S. Dept. Agric., Circ. 114. 8 p., 8 fig. 1918.—*Tylenchus tritici* has been found causing damage to wheat in United States. Present known distribution limited to states of Virginia and California.—Control measures are: use of disease-free seed, a 3-year rotation and sanitary precautions.—D. Reddick.

391. BYARS, LUTHER P. The eelworm disease of wheat and its control. U. S. Dept. Agric. Farmers' Bull. 1041. 10 p., 10 fig. 1919.

392. CARNOT, P., AND J. DUMONT. Technique d'étude de la pénétration des antiseptiques en milieux solides. [Technic for studying the penetration of antiseptics into solid substances.] Compt. Rend. Soc. Biol. Paris 81: 1199-1200. 1918.—The appliance used consists of a porcelain cylinder placed in a Petri dish. The cylinder has a number of indentations about its base. A heavily inoculated agar culture of the test organism is poured into the Petri dish and after this has hardened the antiseptic is poured within the cylinder.—The diffusion takes place through the indentations in the base of the cylinder and after incubation the degree of diffusion and the activity of the antiseptic can be measured by noting the width of the clear zone about the cylinder.—An inorganic salt which will give a color reaction with some component of the antiseptic can be added to the agar if desired. [Abst. by G. H. Smith] in Abst. Bact. 2, Entry 1946.]

393. CLINTON, G. P. Artificial infection of *Ribes* species and white pine with *Cronartium ribicola*. Amer. Plant Pest Committee Bull. 2: 14-15. 1919.—Of 29 species and varieties of *Ribes* inoculated with aeciospores and urediniospores, infection was secured on all but five. Detached *Ribes* leaves, placed in inverted petri dishes produced uredinia in the case of 25 species of *Ribes* out of 35 that were tried. Infection takes place through the stomates. Success was obtained in maturing several other rusts on leaves in petri dishes.—Artificial infection of pines proved that infection is accomplished in the leaves by way of the stomates. Small golden yellow spots appear sometimes as soon as 25 days after inoculation in the greenhouse. Later a distinct band is formed around the leaf. Mycelium is abundant around the fibrovascular system in these golden yellow spots. Later the mycelium was found to follow the bundles into the stem.—W. H. Rankin.

394. COFF, J. E., AND ROBERT W. HODGSON. The June drop of Washington navel oranges; a progress report. California Agric. Exp. Sta. Bull. 290. P. #01-#12. 1918.—See Bot. Absts. 2, Entry 273.

395. COTTON, A. D. Diseases of parsnips. Jour. Bd. Agric. [London] 25: 61-71. 1918.—Slightly modified and abridged form of article published elsewhere. See Bot. Absts. 1, Entry 1612.—D. Reddick.

396. DETWILER, SAMUEL B. Status of white pine blister rust control in 1918. Amer. Plant Pest Committee Bull. 2: 4-11. 1919.—A summary of the results of field work conducted during 1918 in the United States and Canada. In the northeastern states the amount of infection on currants and gooseberries was not as heavy as in the previous two seasons. Many new pine infection centers were found. Bulk of white pines are as yet free from this disease. The removal of currants and gooseberries from stands of white pine throughout this area is advised. Results so far obtained are said to warrant this measure as practical. In Maine three demonstration control areas are in operation. The average cost for the removal of Ribes plants was \$0.32 for the acre. In New Hampshire coöperative efforts resulted in removing Ribes from 66,652 acres at a cost of \$0.39 an acre. A demonstration control area of 1790 acres was established. The average cost was \$0.71 an acre. In Vermont two control areas were established one of 473 acres and the other of 3063 acres. The cost of Ribes eradication on the first area was \$2.47 an acre due to difficult conditions. On the other area it cost on the average of \$0.85 an acre. Work was continued in Massachusetts on several control areas. In one area of 8095 acres the cost was \$0.60 an acre. In other areas totaling 10,611 acres, Ribes eradication cost \$0.70 an acre. In Rhode Island a control area of 12,115 acres was established. Eradication of Ribes cost \$0.28 an acre. Several check plots were rescouted and it was found that 97 per cent of the Ribes bushes had been removed. No control work was done in Connecticut in 1918. In New York State over a million wild Ribes were eradicated on 15 areas totalling 29,337 acres. The average cost was \$1.46 an acre. A demonstration control area of 9314 was freed to the extent of 92 per cent of the Ribes plants, at a cost of \$1.14 an acre.—The plants must be cut below the crown to prevent sprouting. Special tools were used for this purpose. Infected pines were found in three localities in Pennsylvania. None of these areas is close to native pine stands. Diseased pines were found in two nurseries and in an ornamental planting in New Jersey. In states south and west of Pennsylvania including Delaware, Maryland, Virginia, West Virginia, North Carolina, Ohio, Illinois, Indiana, Iowa, Kentucky, Tennessee, Missouri, Kansas, Nebraska, South Dakota and North Dakota, several thousand plantings of white pine were inspected as well as nurseries growing white pine but no blister rust was discovered. The rust was found in imported pines in one locality in Michigan. Scouting showed the disease present in 10 counties in northern Wisconsin. Surveys in Minnesota showed no new centers that were not known the previous season. In both Wisconsin and Minnesota it is the policy to remove all the pines in and adjacent to infection centers and also, so far as possible to eradicate Ribes in the vicinity of infections. No blister rust was found in the western states. In Quebec Province, Canada, the disease was found in one county on the north shore of the St. Lawrence River. The rust was abundant in southern Ontario but could not be found in northern Ontario. Surveys in New Brunswick, Manitoba, Saskatchewan, Alberta and British Columbia revealed no blister rust. Wild and cultivated Ribes are continuous from Ontario to Alberta. Three experimental areas were established in Quebec and Ontario to determine if white pine can be grown successfully in areas where the disease is present. Ribes are being removed from these areas. A table is appended to this report summarizing the number of Ribes plants to the acre and cost of eradication work for different types of woodland on nine demonstration control areas in the northeastern states.—W. H. Rankin.

397. D'HERELLE, E. Technique de la recherche du microbe filtrant bactériophage (*Bacteriophagum intestinale*). (Technic for isolating a filtrable organism (*Bacteriophagum intestinale*) which is bacteriophagous.) Compt. Rend. Soc. Biol. Paris 81: 1160-1162. 1918.—The organism, *Bacteriophagum intestinale*, possesses a definite antagonistic action toward

B. dysenteriae. The organism may be isolated from dysenteric stools by filtration and cultivation in the presence of *B. dysenteriae*.—[Abst. by G. H. Smith in Abst. Baet. 2, Entry 2058.]

398. DOÉ, FR. La conversion en futaie et l'oidium. [Conversion into high forest and the oidium.] Rev. Eaux et Forêts 57: 53-59. 1919.—See Bot. Absta. 3, Entry 2.

399. FEDERAL HORTICULTURAL BOARD, U. S. DEPT. AGRIC. Amendment No. 1 to regulations supplemental to notice of quarantine No. 37. Service and regulatory announcements 60: 21-22. 1919. Also U. S. Dept. Agric., Office of Secretary, Unnumbered leaflet, February, 1919.—Regulation 3 is amended so that bulbs, stocks, cuttings, seeds, etc., may be admitted if packed in soil or sand which has been sterilized under supervision of a duly authorized inspector.—D. Reddick.

400. FEDERAL HORTICULTURAL BOARD, U. S. DEPARTMENT OF AGRICULTURE. Amendment No. 2 to regulations supplemental to notice of quarantine No. 37. Service and regulatory announcements 61: 33. 1919. Also U. S. Dept. Agric., Office of Secretary, Unnumbered leaflet, March 27, 1919.—Regulation 14 is amended to read "Special permits for importation in limited quantities of prohibited stock." Safeguards are to be prescribed in the permits as issued. This amendment is for the purpose of keeping the country supplied with new varieties and necessary propagating stock.—D. Reddick.

401. FEDERAL HORTICULTURAL BOARD, U. S. DEPT. AGRIC. Nursery stock, plant and seed quarantine. Notice of quarantine No. 37, with regulations. Service and regulatory announcements 57: 101-110. 1919.—This quarantine, effective June 1, 1919, supersedes present regulations governing the importation of nursery stock and brings under restriction all other plants or plant products for or capable of propagation. Such products as fruits, vegetables and cereals intended for medicinal, food or manufacturing purposes and field, vegetable and flower seeds are exempt.—Certain bulbs, rose stocks, fruit stocks, including cuttings, scions and buds, and seeds of nut, fruit, forest, and other ornamental and shade trees and of hardly perennial ornamental shrubs may be imported under permit, the terms of which are as follows: they must be free from sand, soil, or earth and they must originate in countries which maintain inspection. The U. S. Department of Agriculture may import any plant or plant product for experimental or scientific purposes.—D. Reddick.

402. HUTT, HARRY. Dry rot from the architect's point of view. Jour. Bd. Agric. London 25: 166-176. 3 fig. 1918.—This article does not attempt to deal with the various forms of fungi which cause dry rot in timber. Investigations were made showing that in the majority of cases where dry rot was found, the work had been carried on without the supervision of an architect. In order to decrease the loss due to this disease the author suggests that all workmen should receive special instruction on the conditions conducive to the production of dry rot, and methods of construction that should be used to prevent it. Conditions favorable for growth of the fungus, and measures of control are given. The instructions given are mainly the sanitary measures employed for the control of fungus diseases.—J. Norma Anderson.

403. JOHNSON, JAMES, AND R. H. MILTON. Strains of White Burley tobacco resistant to root-rot. U. S. Dept. Agric. Bull. 765. 11 p., fig. 1-4. 1919.—The purpose of the bulletin is to show the incorrectness of the commonly accepted explanations of tobacco "exhausted" soils in the Burley section of Kentucky and adjoining states. Root-rot (caused by *Thielavia basicola*) is an important factor in determining systems of tobacco soil management. It is one of the causes of yellowing and improper growth in seed beds. Low temperatures (80° to 75°F.) favor, while high soil temperatures (80° to 100°F.) practically prevent development of the parasite. Thus, in relatively warm seasons diseased plants may partially or wholly recover. In the Burley region rotation is practiced yet "sick" soils obtain; "healthy" soils are first contaminated by the transfer of the fungus by wind, water or animals. In order to

overcome the trouble, and still grow the desired White Burley, the authors present results of selecting for disease resistance. Individuals which remained healthy on "sick" soil were selected, propagated and tested over a period of several years. Under varied conditions these strains have maintained their original degree of resistance. The resistant strain is practically equal to the ordinary Burley in quality (color and texture) of the cured product. It also brings as good price on the warehouse floor as the ordinary Burley. For "sick" soils, the resistant Burley strains are advised for White Burley districts; for "healthy" soils the ordinary Burley may be preferred. [See Bot. Absts. 3, Entry 43.]—*L. R. Hester.*

404. JOHNSTON, J. R., AND STEPHEN C. BRUNER. A *Phyllachora* disease of the royal palm. *Mycologia* 10: 43-44. Pl. 2. 1918.

405. LATHROP, F. H. Leaf-hoppers injurious to apple trees. New York Agric. Exp. Sta. [Geneva] Bull. 451: 185-200. Pl. 1-4, fig. 1-2. 1918.—Consists, chiefly, of a discussion of the distinguishing characteristics, seasonal activities, and life stages of three species of leaf-hoppers which attack the cultivated apple [*Malus sylvestris*], viz., *Empoasca Mali* LeBaron, *E. unicolor* Gill., and *Empoa rosae* L. On pages 195-198 there is an account of some experiments the object of which was to ascertain the rôle of these insects in the transmission of the fire blight disease caused by *Bacillus amylovorus*. The insects were first permitted to feed for a time on blighted apple shoots after which they were transferred to cages containing healthy shoots. Positive results were obtained with *E. Mali*; but the other two species gave negative results, except in one doubtful instance. The behavior of the insects indicated that the diseased tissue was distasteful and injurious to them.—*F. C. Stewart.*

406. LEE, H. A. Copper stearate. Ann. Rept. Agric. and Hort. Res. Sta. Univ. Bristol 1917: 39-42. [1918.]—If copper sulfate solution is added to soap solution an opaque light blue precipitate appears, the individual particles of which measure 2-3 μ . Both solutions must be dilute (1 per cent) and the soap must be in excess. If much more than 20 cc. of copper sulfate solution is added to 100 cc. of soap solution a sticky mass is formed. The chemistry of the mixture is discussed. It wets resistant surfaces and combined with 2 per cent paraffin emulsion will wet such surfaces as mildew spots. Once dried on foliage it resists wetting completely. Its fungicidal properties have not been determined.—*D. Reddick.*

407. MACMILLAN, H. G. Fusarium-blight of potatoes under irrigation. Jour. Agric. Res. 16: 279-303. Pl. 37-41. 1919.—Report of the investigations made in the Greeley, Colorado district during the years 1915, 1916, 1917 of the disease commonly known as "potato-wilt," "Fusarium-wilt," etc. The term "Fusarium-blight" is suggested as being more applicable to all stages of the disease. *Fusarium oxysporum* was found to bring about all phases of the disease; other species of *Fusarium* were found to bring about similar phenomena. Remarkable symptoms of the disease noted are, (a) wilting and dying of a single leaf while the remainder of the plant remains healthy, (b) evidence of the disease "when the first leaves appear," (c) passing of a plant from health to complete collapse within two days, and, (d) rolling of the leaves without the usual wilting. The soil, not the seed, is the principle source of the inoculum. Seed pieces furnish an important avenue of attack, injured surfaces being much more vulnerable than uninjured ones. Certain Rural varieties were found remarkably susceptible and certain Pearl varieties remarkably resistant to the disease.—Selection for resistance, superior cultural practice, and the use of whole seed free from wounds are suggested as control measures.—*Charles R. Stevenson.*

408. MARTIN, WALTER. The physical factors influencing infection. Ann. Surg. Philadelphia, 68: 436-445. 1918.—A general discussion of wound infection, placing emphasis upon the importance of pressure at the focus of infection, the presence of foreign bodies, the effect of devitalized and necrotic tissues, and the presence of dead spaces in the wound. [Abst. by G. H. S[mith] in Abst. Bact. 2, Entry 2150.]

409. McCUBBIN, W. A. Investigation in the Canadian Department of Agriculture. Rept. White Pine Blister Rust Control, Amer. Plant Pest Committee Bull. 2: 13-14. 1919.—Sunlight filtered through glass to remove its ultra-violet content did not materially affect germination of spores of *Cronartium ribicola* even after five hours exposure. Both aeciospores and urediniospores readily fall victims to ultra-violet radiations, however, at an exposure of 2.5 minutes to the radiations from a source whose ultra-violet energy may be represented by 0.38. In 22 woodlots in Niagara district blister rust was present in 19. An average of 2.3 per cent of the trees were found infected; the highest percentage infection was 33.54 in one woodlot. In 10 plantations at Oakville where disease has been present since 1915, one pine out of 2249 was found diseased. In Simcoe county where the fungus has existed since 1912 no diseased pine could be found in three plantations of 600 trees. Author believes that about 1 per cent of the pines under conditions favorable to infection, will become infected each year.—W. H. Rankin.

410. MESTREZAT, W., AND TH. CASALIS. Propriétés antiseptiques et mode d'emploi du monochlorure d'iode. [The antiseptic properties and the method of use of monochloride of iodine.] Compt. Rend. Soc. Biol. Paris 81: 1196-1199. 1918.—Solutions of iodine chloride possess a high antiseptic property and are harmless to the tissues. The solution is used in a concentration of 0.3 gram per liter. [Through absts. by G. H. Smith] in Abst. Bact. 2, Entries 1962 and 1953.—D. Reddick.

411. METCALF, HAVEN. Summary of the white pine blister rust situation. Rept. White Pine Blister Rust Control, Amer. Plant Pest Committee Bull. 2: 16. 1919.—The cost of removing wild currants and gooseberries is low and will not compare with the cost of the damage if the bushes are permitted to remain and spread infection to the pines. Resumption of planting white pine in East is warranted. *Ribes* must be eradicated from the planting area and the plantation kept free of *Ribes* during subsequent years. The wisdom of state and national quarantines confirmed by the demonstrated fact of the over-wintering of the fungus on *Ribes*. These state and national quarantines must continue to be rigidly enforced for an indefinite period.—W. H. Rankin.

412. MONZIEUX, M. Procédé de désinfection absolue des mains en trois minutes par une pâte à base de chlorure de chaux. [Method of securing an absolute disinfection of the hands in three minutes by the use of a paste of calcium chlorite.] Compt. Rend. Soc. Biol. Paris 81: 600-602. 1918.—The formula for the paste is:

	grams
Calcium chloride.....	2
Sodium carbonate.....	2
Boric acid.....	10
Talc.....	10

—[Abst. by G. H. S[mith] in Absts. Bact. 2, Entry 1948.]

413. NORTON, J. B. Washington asparagus: information and suggestions for growers of new pedigree rust-resistant strains. U. S. Dept. Agric., Office Cotton, Truck and Forage Crop Diseases, Circ. 7. P. 8. Washington [D. C.], 1919.

414. PARAVICINI, E. *Favolus europaeus* Fr. Ein Schädling des Nussbaumes. [An enemy of the nut trees.] Schweiz. Zeitschr. Forstwesen 70: 15-17. 1919.—Since the culture of nut trees has assumed commercial importance in Switzerland, the enemies of the nut tree must be controlled. *Juglans regia* L. is subject to attack by the following fungi: *Polyporus sulfureus*, *P. imbricatus*, *P. squamosus*, *P. cinnabarinus*, *P. fomentarius*, *P. ignarius*, *P. hispidus*, *Dasyscypha cinnabarina*, *Agaricus ostreatus*, and *Favolus europaeus*.—*Favolus europaeus* has been found to be the most virulent. This fungus has been found in various parts of Switzerland, which indicates that it may become a serious factor.—The method of infection has not been experimentally determined, but it is known that the fungus enters through wounds in the branches.—The only method of control known is to remove all diseased branches and cover the wound with grafting wax.—J. V. Hofmann.

415. PARKINS, JOSEPH A. Preliminary report of a method for estimating *in vivo* the germicidal activity of antiseptics. *Ann. Surg. Philadelphia* 68: 241-244. 1918.—The count of organisms secured by culture from the wound is regarded as more accurate than counts made from smear preparations.—The applications of disinfectants (chlorinated compounds) to the wounds caused marked drops in the plate counts.—(Abst. by G. H. S[mith] in *Abst. Bact.* 2, Entry 1947.] *

416. RIGAN, W. S. Progress of experiments for destroying *Ribes* with chemicals. Rept. White Pine Blister Rust Control, Amer. Plant Pest Committee Bull. 2: 15-16. 1919.—(Diluted fuel-oil applied as a fine spray to foliage and twigs produced defoliation and under favorable conditions the bark was penetrated and the bushes killed. Two or three applications were necessary to kill skunk currants in the shade. Other less effective foliage sprays tested included sodium arsenite, salt solution, kerosene and several proprietary mixtures. One of the latter at 1 to 60 strength killed the foliage of skunk currants in 5 hours in a sunny exposure; 1 to 40 strength killed the foliage in 15 minutes. Of several liquids and oils applied at the base of the bushes, "dip" oil has given the most satisfactory results.—W. H. Rankin.

417. SPAULDING, PERLEY. Investigations in the United States Department of Agriculture.—Rept. White Pine Blister Rust Control, Amer. Plant Pest Committee Bull. 2: 11-13. 1919.—Investigations carried on at Block Island, Rhode Island; Kittery Point, Maine; North Conway, New Hampshire, and Lewis, New York. Aeciospores of *Cronartium ribicola* were caught in traps at an altitude of 2700 feet above the nearest known source of spores which was five and one-half miles distant. Spore-traps 20 feet above fruiting cankers caught many more spores than did traps at either side or below. Aeciospores are disseminated for miles away from their source; they retain their viability for weeks and show a higher percentage of germination than the other spores. Urediniospores were found by spore-traps to be limited in their dissemination to a distance of one to three hundred yards.—At Lewis, New York, rain periods were followed in due time by new generations of spores on *Ribes*. Seven distinct generations were noted. Sporidia abundantly produced in September and thereafter. These spores were caught at no distance over 200 feet from the infected bushes.—Evidence seems to warrant the belief that a *Ribes*-free zone of from 100 to 600 yards according to topographic and other conditions will protect pines from infection. Urediniospores from over-wintered leaves under bushes were used in successful infection experiments in March (See *Phytopath.* 8: 617-619. 1918).—W. H. Rankin.

418. THOMAS, C. C. Seed disinfection by formaldehyde vapor. *Jour. Agric. Res.* 17: 33-39. 1 fig. 1919.—The danger involved in treating many kinds of seeds with liquid disinfectants led to trials with formaldehyde vapor. The seeds are spread out on trays and covered tightly. A small jet of steam is admitted to the container and formaldehyde is injected into the steam intake by air pressure. The film of condensation water about the seeds evaporates quickly setting free the gas.—Various kinds of seeds were tested and none was injured materially by treatment for 2 hours with formaldehyde used at the rate of 30 ounces of solution (40 per cent) to 1000 cubic feet. Under similar conditions masses of bacteria and of spores of several parasitic fungi were killed by using 20 ounces of formaldehyde to 1000 cubic feet. Masses of spores of four species of *Fusarium* were not killed when subjected to treatment for 2 hours with vapor at the rate of 30 ounces to 1000 cubic feet.—D. Reddick.

419. WELDON, G. P. Pear blight epidemic in mountain countries. *Month. Bull. California Comm. Hort.* 7: 459. 1918.—Pear blight (*Bacillus amylovorus*) was very severe in higher altitude sections of California, places where, before this season (1918), it was scarcely known.—D. Reddick.

420. WINSTON, G. R., AND H. R. FULTON. The field testing of copper-spray coatings. U. S. Dept. Agric. Bull. 785. 9 p., fig. 1-4. 1919.—The authors point out that varying local conditions make the spray calendar inadequate, and therefore a suitable chemical test of the

spray coating seems desirable in determining proper time for renewal of applications. The method, which is fully described, consists in making comparisons between washings from sprayed leaves and a series of known dilutions of a standard copper solution. By the same method one may be assisted in correcting faulty spraying practices, either in preparation of the mixture or manner of application.—*L. R. Heiler.*

421. WORMALD, H. Brown rot of apples. *Jour. Bd. Agric.* [London] 25: 299-302. Fig. 1-3. 1918.—Brief description of brown rot as caused by *Monilia fructigena* Pers. (*Sclerotinia fructigena* Schroeter) is given. The life history of the parasite is also summarized. Overwintering is said to occur in mummied apples hanging to the tree. Conidia produced in the summer, and which remain on the pustules or are carried away, usually lose their vitality.—The fungus enters fruits through wounds, such as are produced by biting insects. The fungus may, on some soft-wooded varieties, pass from the affected fruit into the fruiting spur and even into the branch forming a canker around the base of the spur. In this respect it resembles the disease of apple produced by a closely related species, *Monilia cinerea* Bon. (see *Jour. Bd. Agric.* 24: No. 5). Cases where affected fruits turn black, the skin remaining smooth or nearly so and bearing few or no pustules, are described, but the conditions effecting such symptoms have not been determined. Removal of affected fruits, spurs and cankered areas is advised.—*L. R. Heiler.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

HENRY KRAEMER, *Editor*

422. ABBOTT, W. S. A study of the effect of storage, heat, and moisture on Pyrethrum. *U. S. Dept. Agric. Bull.* 771. 8 p. 1919.—Various experiments on whole and ground flower heads of *Pyrethrum cinerariaefolium* (Trev.) showed that their efficiency as an insecticide was more lasting in the whole than in the powdered condition.—*A. R. Bechtel.*

423. ANONYMOUS. Mexico's little known botanicals. *Pharm. Era* 52: 58. 1919.—A correspondent submits a list of ten drug plants giving the Mexican names, botanical nomenclature, and the names of the states in which they grow.—*Oliver A. Farwell.*

424. ANONYMOUS. Geography of U. S. botanical drugs. *Pharm. Era* 52: 63-66, 89-92. 9 fig., 2 maps. 1919.—An attempt is made to give the geographical source of the botanical drugs of the United States Pharmacopoeia and of the National Formulary. The greater number of these plants are indigenous to the Western Hemisphere and most of these to U. S. A.; it is pointed out that many of them are likewise admitted to the pharmacopoeias of other countries and that still others have a more or less commercial demand for use abroad. The cultivation of drug-plants for commercial purposes received an added stimulus as a result of the war and scarcity of supplies but as an industry the cultivation of plants has yet to be developed. It is said that the vegetative regions of North America correspond very closely to those of the northern half of the Eastern Hemisphere and that the character of the vegetation is determined by the alternation of summer and winter heat and by man himself. The different regions are contrasted and the more important commercial pharmaceutical plants in each are listed and plotted for the Western Hemisphere. The necessary information regarding climatic and soil conditions, plant idiosyncrasies, and financial resources, and control of a strictly limited market, to make cultivation of drugs a success is indicated.—*Oliver A. Farwell.*

425. BERINGER, G. M. [Rev. of: MAIDEN, J. H. A critical revision of the genus *Eucalyptus*. Vol. IV, Part 6. Published by the Government of the State of New South Wales.] *Amer. Jour. Pharm.* 91: 328-329. 1919.

426. BOURQUELOT, EM., AND H. HÉRISSEY. Application de la méthode biochimique à l'étude des feuilles d'*Hakea laurina*. Extraction d'un glucoside (arbutin) et de quebrachite. [Biochemical methods applied to the study of the leaves of *Hakea laurina*. Extraction of arbutin and quebrachite.] Compt. Rend. Acad. Sci. Paris 168: 414-417. 1919.—Leaves of *Hakea laurina* R. Br. (an Australian tree of the *Proteaceae*), which is cultivated as an ornamental tree in France, were examined chemically and two glucosides as well as quebrachite, were found. Arbutin and quebrachite were isolated. Treatment of leaf preparations with invertase and emulsin demonstrated the presence of sucrose and a hydrolysable glucoside. It is noted that arbutin and quebrachite were also found together in the leaves of *Grevillea robusta* A. Cunn., another member of the *Proteaceae*.—V. H. Young.

427. EWE, GEORGE E. Notes on emetine hydrochloride. Amer. Jour. Pharm. 91: 276-280. 1919.—The examination of samples of emetine hydrochloride, representing the products of five American manufacturers, showed that a pale reddish-purple color, followed rapidly by a brown and finally a light green was obtained in each case, whereas the United States Pharmacopoeia states that no purple color should be produced, indicating the absence of considerable proportions of cephaeline. Quantitative determinations were made to ascertain if the amount of cephaeline present was dangerously great, with the following results: Sample No. 1, 1.65 per cent; No. 2, 3.10 per cent; No. 3, 2.1 per cent; No. 4, 0.80 per cent; No. 5, 2.10 per cent. Judging from this, if the rule were interpreted literally it would exclude the majority of emetine hydrochloride on the market. A quantitative test, as suggested by the author, should be resorted to; the adoption of an upper limit of 3 per cent of cephaeline would insure the absence of excessive proportion of cephaeline in the emetine hydrochloride. A series of experiments were performed to note the effect of heat, light, acidity and tin on emetine hydrochloride, with the following results. Crystallized emetine hydrochloride practically withstands sterilization temperatures; diffused sunlight for a number of weeks is required to just appreciably darken solutions of emetine hydrochloride, and direct sunlight of at least three hours duration is required to just appreciably darken solutions; titration for acidity is to be preferred to the United States Pharmacopoeia litmus test; metallic tin acts similarly to a soluble alkali in liberating the alkaloid from solutions of emetine hydrochloride, the time required, however, being prolonged.—Anton Hogstad, Jr.

428. HECKEL, JAMES E. Modern paint vehicles. Amer. Jour. Pharm. 91: 287-297. 1919.—As the annual production of flax in the United States is insufficient and has been decreasing for the last decade, especially during the past two or three years, it is desirable to devise means to overcome this shortage.—The solution of the problem might be attained in any of three ways: increasing flax production; importing enough flax-seed to make up the shortage; or using other oils to take out. The three questions are discussed by the author, the main emphasis being placed on the use of other oils. A comparison of various oils is given, such as perilla, hempseed, lumbang ("Kukui" or candlenut), soy bean, china wood, menhaden and poppyseed.—Anton Hogstad, Jr.

429. LLOYD, FRANCIS E. The origin and nature of the mucilage in the cacti and in certain other plants. Amer. Jour. Bot. 6: 156-166. 1919.—See Bot. Absts. 3, Entry 442.

430. MIRANDE, MARCEL. Sur les réactions microchimiques et les localisations de l'alkaloïde de l'*Isopyrum thalictroides*. [Concerning the microchemical reactions and localization of the alkaloid of *Isopyrum thalictroides*.] Compt. Rend. Acad. Sci. Paris 168: 316-317. 1919.—Harsten is isolated the alkaloid isopyrine from *Isopyrum thalictroides* 1872. By means of microchemical studies author locates the alkaloid principally in definite regions of the roots and rhizomes, although it was also located in lesser amounts in the stems and petioles. This alkaloid appears to be distinct from that demonstrated by MacDougal (1896) in an American species, *Isopyrum biternatum*.—V. H. Young.

431. RILEY, W. J. A use of galls by the Chippewa Indians. Jour. Econ. Entomol. 12: 217-218. 1919.—The writer calls attention to the fact that Chippewa Indians made use of

galls produced by a species of *Eriophyes* on sumac. *Rhus copallina* and *R. glabra*, a fact that was overlooked by Miss Pagan in her paper on the uses of insect galls (Amer. Nat. 52: 155-176. 1918).—These galls occur abundantly in Minnesota and are collected in late summer by the medicine men, who use them in an infusion as a remedy for diarrhoea and in poultice for the treatment of burns.—A. B. Massey.

432. SCHMIDT, ELSA. A new method for a separate extraction of hydrastine and berberine from golden seal on a large scale, and a review study of the two alkaloids. Amer. Jour. Pharm. 91: 276-275. 1919.—The paper deals with the separate extraction of hydrastine and berberine, the hydrastine being extracted by the use of benzol and the berberine by hot water acidulated with acetic acid, after the extraction of the hydrastine. The author also gives methods for the estimation of these two alkaloids, tests for same, method for detection in plants and a few notes on the properties and uses of these two alkaloids.—Anton Hogstad, Jr.

PHYSIOLOGY

B. M. DUGGAR, *Editor*

GENERAL

433. COLLINS, S. HOARE. Plant products and chemical fertilizers. xvi+296 p. Bailliere, Tindall and Cox: London, 1918.—This is one of a series of books proposed on "Industrial Chemistry." The present volume is divided about equally into four parts as follows: (1) fertilizers, (2) soils, (3) crops, and (4) the production of meat. In the third part is included most of the plant physiological material and the various sections represent the subject under the following captions: photosynthesis, the carbohydrates produced in crops, the oil-bearing plants, the nitrogen compounds in plants, miscellaneous plant products, and produce variability.—B. M. Duggar.

DIFFUSION, PERMEABILITY

434. STILES, WALTER, AND INGVAR JØRGENSEN. On the relation of plasmolysis to the shrinkage of plant tissue in salt solutions. New Phytol. 18: 40-49. Fig. 1-2. 1919.—This is essentially an answer to D. THODAY's paper (New Phytol. 17: 108. 1918).—I. F. Lewis.

435. WAYNICK, D. D. The chemical composition of the plant as further proof of the close relation between antagonism and cell permeability. Univ. California Publ. (Agric. Sci.) 3: 135-243. Pl. 15-24, fig. 1-28. 1918.

WATER RELATIONS

436. GRAY, JOHN, AND GEORGE J. PEIRCE. The influence of light upon the action of stomata and its relation to the transpiration of certain grains. Amer. Jour. Bot. 6: 131-155. Fig. 1-18. 1919.—The work of F. Darwin and of Lloyd on the action of stomata is briefly reviewed. In the present paper the action of the stomata is studied in wheat, oats, rye, barley and wild oats (*Avena fatua*), growing in moist soil, in saturated soil and in dry soil, and under different degrees of temperature, humidity and illumination. Direct observations and measurements of the stomatal aperture were made in the living leaf by fastening it gently to the stage of a microscope.—The opening and closing of the stomata depend chiefly upon light, since they were found to open in light and to close in darkness, almost independently of other factors. An increase or decrease in the amount of light has a corresponding effect upon the width of the stomatal openings. If the amount of water in the soil falls below the minimum needed to maintain the turgidity of the guard cells, however, they will remain closed regardless of the illumination. Wild oats in the greenhouse behave essentially like the other species studied, but, unlike them, when grown out of doors, the stomata close in the middle of

the day on bright days. This difference is ascribed to the xerophytic environment under which the wild oat normally grows. The moisture, soil and light requirements and the stomatal behavior of the cultivated species studied were essentially the same, though not identical. The authors call attention to the fact that light, the factor which regulates the rate of food manufacture, also regulates the opening of the stomata through which raw material for food manufacture enters.—E. W. Sinnott.

MINERAL NUTRIENTS

437. SKINNER, J. J., AND F. R. REID. The influence of phosphates on the action of alpha-crotonic acid on plants. *Amer. Jour. Bot.* 6: 187-180. Fig. 1-9. 1919.—Alpha-crotonic acid, even in low concentrations, is harmful to plants. The action of nutrient salts in counteracting this effect was studied. Wheat plants were grown in a nutrient solution of calcium acid phosphate, sodium nitrate and potassium sulphate, one set with and another without crotonic acid. The familiar "triangle" system was used to study the effect of various proportions of nitrate, phosphate, and potash. The green weight of plants produced after 12 days was determined. Crotonic acid was found to depress this weight on the average of 52 per cent, but to have a much less harmful effect in solutions high in phosphate than elsewhere. To determine whether the calcium or the phosphate or both were important in causing this effect, sodium salts were substituted for calcium. Mono-, di- and tri-sodium phosphates, respectively, were used, the other members of the solutions remaining unchanged. Mono-sodium phosphate was similar in its effects to mono-calcium phosphate. Di- and tri-sodium phosphates, however (which are alkaline rather than acid in reaction), when in relatively strong concentration, counteract even more markedly the harmful effect of the crotonic acid. The effect of crotonic acid is therefore much ameliorated by the presence of phosphate and is less severe in solutions containing alkaline salts.—E. W. Sinnott.

METABOLISM (GENERAL)

438. BOURQUELOT, EM., AND H. HÉRISSEY. Application de la methode biochimique a l'étude des feuilles d'*Hakea laurina*. Extraction d'un glucoside (arbutin) et de quésbrachite. [Biochemical methods applied to the study of the leaves of *Hakea laurina*. Extraction of arbutin and quésbrachite.] *Compt. Rend. Acad. Sci. Paris* 168: 414-417. 1919. [See Bot. Absts. 3, Entry 426.]

439. COMBES, RAOUL. Recherches biochimiques expérimentales sur le rôle physiologique de glucosides chez les végétaux. [Biochemical investigations on the physiological rôle of glucosides in plants.] *Rev. Gen. Bot.* 29: 321-350, 353-376. Pl. 1-5. 1917. *Ibid.* 30: 5-16, 33-50, 70-93, 105-106, 146-157, 177-205, 226-238, 245-270, 283-301, 321-322, 335-364. Pl. 14, 18, 18, 18. 1918.—This paper, which gives the facts gained during a period of nearly ten years of experimental work, contains a review of the general history of glucosides; a discussion of some new external and internal factors that determine the glucoside content of the plant; with a detailed account of new apparatus, its use, and the results of experiments. The plants were grown under sterile conditions throughout the period of experimentation, by the strict sterilization of seeds, media, and all apparatus. Small plants were cultivated in special tubes so that the gas they used was sterile, being allowed to circulate through cotton stoppers. Knop's medium with and without the addition of a specific glucoside was used as the principal culture medium. These nutrient media were made solid when necessary by the addition of 5 per cent gelatine or pumice. At the end of the culture period the sterility of the medium was tested by bouillon inoculation. This was followed by a quantitative analysis of the medium, the plant stem, and the plant root, which gave data on the absorption and excretion of material. Plants grown under sterile conditions such that their roots were in contact with a nutrient medium containing a specific glucoside behaved according to the species to which they belonged. Thus *Agrostemma Githago* grew in solutions containing from 1 to 10 per cent of agrostemma saponin (extracted from *Agrostemma* seeds) without showing any signs of suffering, while plants not related to this species (*Polygonum* and *Raphanus*) grew only in 0 to 0.1 per cent

solutions of this glucoside. The disturbing effect of *agrostemma* saponin on the latter plants was shown by the death and falling of the root hairs, the coralloid aspect of the radical, and the decrease in the production of dry material. The fact that *Agrostemma Githago* will grow in solutions containing 1000 times more *agrostemma* saponin than species of plants that do not produce this glucoside, indicates the immunization of *Agrostemma Githago* against its glucoside. In like manner saponin had a toxic effect on *Oenothera*, but did not affect *Saponaria* which produces this glucoside. Amygdalin was toxic and decreased the production of dry material in *Raphanus sativus*, *Vicia sativa*, *Vicia macrocarpa*, and *Polygonum*. Vicianin was not toxic for *Vicia*. Amygdalin was not absorbed nor used by the radish as a source of nitrogen or carbon. *Vicia* was not permeable to amygdalin nor *agrostemma* saponin. *Agrostemma Githago* could not absorb nor use *agrostemma* saponin as a food. One is not justified in concluding that glucosides play no rôle in the plant and are simply waste products, from the fact that they cannot penetrate the roots.—Dean A. Pack.

440. HULTON-FRANKEL, FLORENCE, HELENE BARBER, AND ELEANORE PILE. Studies on synthetic mediums. I. Study of the characteristics of some bacteria on a simple synthetic medium. Jour. Infect. Diseases 24: 9-16. 1919.—A synthetic medium having the following constituents, with water to make one liter:—

cc.	cc.
129.5 Molar H_2PO_4	100.0 Molar KOH
18.8 Molar CH_3COOH	10.0 . . . 0.01 per cent Fe_2Cl_3
17.8 Molar NH_4OH	10.0 . . . 0.01 per cent $MgSO_4$
100.0 Molar NaOH	10.0 . . . 0.01 per cent $CaCl_2$

A hydrogen-ion concentration of 10^{-7} N is suitable for the growth of most saprophytic bacteria and some facultative parasites. None of the characteristics of the organisms were lost from growth on the synthetic medium. [See also next following Entry, 441.]—Selman A. Waksman.

441. HULTON-FRANKEL, FLORENCE, AND HELENE BARBER. Studies on synthetic mediums. II. Sugar fermentations in synthetic mediums. Jour. Infect. Diseases 24: 17-18. 1919.—The same formation of acid and gas, with very few exceptions, was obtained for a number of bacteria by using different sugars in broth and in a synthetic medium, the composition of which has been given. [See also next preceding Entry, 440.] The use of the synthetic medium presents special advantages in routine field work.—Selman A. Waksman.

442. LLOYD, FRANCIS E. The origin and nature of the mucilage in the cacti and in certain other plants. Amer. Jour. Bot. 6: 158-166. 1919.—The mucilage of *Opuntia*, of certain Malvaceae, and of *Astragalus gummifer* was studied. The mucilage cells in *Opuntia* are scattered through the cortical and medullary parenchyma, the exact distribution varying somewhat with the species. They are almost entirely absent from the primary growing point, being secondary in origin and arising first in the medulla and later in the cortex. They are first recognizable by their large size. The walls, at first like those of the adjacent cells, soon become thickened by the change of their inner zone from ordinary cellulose to hydrocellulose. It is from this zone that the mucilage arises; and as the layer of mucilage swells it compresses the protoplasm toward the center of the cell, except at the pits, where the wall is not hydrolyzed and where projections of the protoplasm remain in contact with it. A treatment of tissue with anaesthetics caused an abundant oozing of mucilage, due to the fact that the parenchyma cells around the mucilage cells become asphyxiated and gave up their water into the intercellular spaces, whence it was used in hydrating the mucilage cells. Starch is found in the protoplasts of the mucilage cells, a fact which indicates that the protoplasts may remain alive. The mucilage layer shows lamination, which the author believes to be due to varying degrees of hydration or to a layering in the original cellulose wall. He brings forward evidence that the mucilage is neither laid down as a secondary layer, nor secreted within the protoplast or on its surface, but that it is strictly a development of the primary wall of the

cell. He discusses the views of previous workers as to the origin of mucilage.—The mucilage of *Opuntia* is hydrolyzed by various acids and submits slowly to the digestive action of organisms, gradually losing its viscosity. The effect of various stains upon mucilage was studied. Some were adsorbed vigorously, others less so and others not at all. The degree of adsorption is related to the degree of hydration. The viscosity of the mucilage was found to be lowered by those dyes which are adsorbed, "at a rate and to an extent in direct relation to the degree of adsorption."—E. W. Sinnott.

443. MAGOON, C. A., AND J. S. CALDWELL. A new and improved method for obtaining pectin from fruits and vegetables. *Science* 47: 592-594. 1918.

444. MIRANDE, MARCEL. Sur les réactions microchimiques et les localisations de l'aloéïde de l'*Isopyrum thalictroides*. [Concerning the microchemical reactions and localizations of the alkaloid of *Isopyrum thalictroides*.] *Compt. Rend. Acad. Sci. Paris* 168: 316-317. 1919. —See Bot. Absts. 3, Entry 430.

445. MOLLARD, MARIN. Production d'acide citrique par le *Sterigmatocystis nigra*. [Production of citric acid by *Sterigmatocystis nigra*.] *Compt. Rend. Acad. Sci. Paris* 168: 360-363. 1919.—Wehmer (1893) created the genus *Citromyces* on the basis of the fact that certain fungi produced citric acid under certain conditions. It was considered that this fact was of significance in denoting relationship and that the production of citric acid was of the same significance as the formation of oxalic acid in *Aspergillus*, *Penicillium*, and *Sterigmatocystis*. Experiments by the author show that conditions unfavorable to the growth of the mycelium of *Sterigmatocystis nigra* and especially a small amount of nitrogen compared with the amount of sugar present in the substratum, result in the formation of citric acid. Both oxalic acid and citric acid may appear in the same cultures or they may each appear separately. Under the conditions studied much greater amounts of citric acid than of oxalic acid were formed.—The conditions resulting in the formation of citric acid in *Sterigmatocystis nigra* are the same conditions that favor its formation in *Citromyces*. Wehmer showed further that citric acid may also be formed by *Mucor pyriformis* and *Penicillium luteum*.—The author points out the danger of employing physiological characteristics in the classification of organisms in systems where morphological characteristics are also employed.—V. H. Young.

446. NEIDIG, R. E., C. W. COLVER, H. P. FISHBURN, AND C. L. VON ENDE. The acids of silage. *Idaho Agric. Exp. Sta. Bull.* 104: 19-20. 1918.

METABOLISM (NITROGEN RELATIONS)

447. NELLER, J. R. Studies on the correlation between the production of carbon dioxide and the accumulation of ammonia by soil organisms. *Soil Science* 5: 225-241. Pl. 1, fig. 1-6. 1918.

METABOLISM (ENZYMES, FERMENTATION)

448. BOURQUELOT, EM., AND M. BRIDEL. Synthèses biochimiques simultanées du gentiobiose et des deux glucosides β du glycol par l'émulsine. [Simultaneous synthesis of gentiobiose and of two β -glucosides of glycol by emulsin.] *Compt. Rend. Acad. Sci. Paris* 168: 253-256. 1919.—Emulsin of almonds is apparently a mixture of at least three enzymes; viz., gentiobiase, cellobiase and β -glucosidase. Theoretically such a mixture of enzymes acting on a mixture of β -glucose and glycol in diluted solution should bring about the synthesis of four substances; viz., cellobiose, gentiobiose and mono- and diglucoside of glycol. Experiments conducted along these lines yielded all of these substances in crystalline form except cellobiose.—V. H. Young.

449. BOURQUELOT, EM., AND M. BRIDEL. Synthèse biochimique, à l'aide de l'émulsine, du glucoside de l'alcool naphthylétique alpha. [Biochemical synthesis of glucoside beta by emulsin.] *Compt. Rend. Acad. Sci. Paris* 168: 323-324. 1919.—Naphthyllic alcohol (α -naphthyl-carbinol) obtained by Grignard's reaction was mixed with glucose in acetone solution and to the mixture emulsin was added. Changes in the rotatory power of the solution were noted.

At the end of 5 years, a glucoside (β -glucoside of α -naphthyllic alcohol) was isolated in crystals. This glucoside does not reduce copper solutions but, on hydrolysis with sulphuric acid or emulsion, copper solutions were reduced.—V. H. Young.

ORGANISM AS A WHOLE

450. BRACHER, ROSE. Observations on *Euglena doses*. Ann. Bot. 33: 93-108. 5 fig. 1919.

451. NEIDIG, R. E., C. W. COLVER, H. P. FISHBURN, AND C. L. VON ENDE. Factors involved in the ripening of fruits. Idaho Agric. Exp. Sta. Bull. 104: 22-25. 1918.

GROWTH, DEVELOPMENT, REPRODUCTION

452. TROWBRIDGE, C. C., AND MABLE WEIL. The coefficient of expansion of living tree trunks. Science 48: 348-350. 1918.

TEMPERATURE RELATIONS

453. KIDD, FRANKLIN, AND CYRIL WEST. The influence of temperature on the soaking of seeds. New Phytol. 18: 35-39. 1919.—"The soaking of pea seeds (*Pisum sativum*) and of bean seeds (*Phaseolus vulgaris*) in excess of water is injurious at all temperatures, that is, the number and vigor of the plants produced are diminished. This injurious effect is more marked with low temperatures of soaking (5-10°C.) than with medium temperatures (15-20°C.). At higher temperatures the amount of injury resulting again increases, so that the curve of the number of plants produced from seeds soaked at different temperatures rises and falls about an optimum in the region of 15-20°C."—Authors' summary.

TOXIC AGENTS

454. REGAN, W. S.* Progress of experiments for destroying *Ribes* with chemicals. Rept. White Pine Blister Rust Control. Amer. Plant Pest Committee Bull. 2: 15-16. 1919.—See Bot. Abstr. 3, Entry 416.

MISCELLANEOUS

455. GROVE, OTTO. A ropy cider bacillus. Ann. Rept. Agric. and Hort. Res. Sta. Univ. Bristol 1917: 15-17. [1918.]—Samples of cloudy cider held for 6 months became nearly milky with a ropy deposit. The deposit consisted principally of bacteria. The aroma and flavor were acetic; specific gravity 1.001; acid (determined as malic) 0.9 per cent; tannin 0.08 per cent; alcohol 4.02 per cent by weight.—A small rod shaped organism is said to cause the trouble. It is irregular in size, 1.5-2.5—0.3-0.5 μ , often in twos and in short chains, revolving motility in a few individuals, involutions forms not uncommon, spores not observed. Growth in various media is described. Malic, tartaric and citric acids added to 2 per cent glucose in "yeast water" practically suppressed growth in 0.4 per cent concentrations and entirely suppressed it in 0.8 per cent concentrations.—It is thought that if the mixture of apples used to make cider contains a sufficient proportion of sour apples to bring the initial acidity up to 0.5 per cent, or more, there is no danger of ropiness setting in.—D. Reddick.

456. HILLS, T. L., AND J. J. PUTNAM. The influence of various woods on bacterial activity in the soil. Idaho Agric. Exp. Sta. Bull. 104: 16-18. 1918.

457. MORREAU, FERNAND. Sur le blanchiment des pâtes à papier colorées par des mycéliums de champignons. [Bleaching of paper paste colored by fungus mycelium.] Bull. Trimest. Soc. Mycol. France 34: 29-30. 1918.—The paper-school at Grenoble reported that the presence of a fungus belonging to the Sphaeriaceae within a paper paste caused a resistance to bleaching with hypochlorites. The author carried out a number of experiments to determine the resisting power of various fungi to bleaching with hypochlorites. In all cases he obtained discoloration of the colored spores or mycelium of the fungi under study; e.g., the black spores of *Rhizopus nigricans*. The presence of an excess quantity of black or brown fungi, however, would force the manufacturer to use such large quantities of discoloring material as to impair the fibers of the paste.—Fred C. Werkenthin.